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ABSTRACT

Compiled in this catalog are the results of a national survey of American colleges and universities which elicited information about formal and nonformal energy education programs sponsored by institutions of higher education. Programs described range from credit courses and degree programs to extension, non-credit, adult education courses to conferences, seminars, and workships to information, consulting, and community services. Some of the energy-related topics included in the programs are alternative and conventional energy sources, management, environment studies, engineering, public affairs, and teacher education. The catalog is arranged alphabetically by state and is cross-indexed by the name of the institution, by state, and by topic. Entries may include up to 16 different types of information including name of institutions, name of program or course, contact person, type of program, degrees, description, representative courses, faculty, and research. (DC)

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The ENERGY EDUCATION CATALOG

PROGRAMS IN AMERICAN COLLEGES & UNIVERSITIES

Edited by Gary S. Schiff

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
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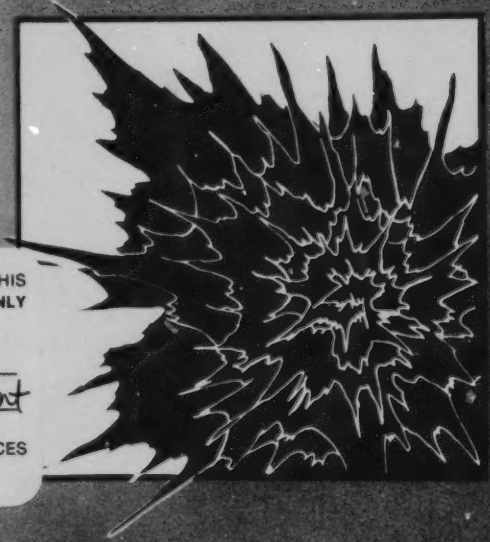

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American Council on Education

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are gratefully acknowledged

The ENERGY EDUCATION CATALOG

PROGRAMS IN AMERICAN COLLEGES & UNIVERSITIES

Edited by Gary S. Schiff

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FOREWORD

Since its founding some twenty years ago, the Academy for Educational Development has sought to serve the higher education community. On an individual basis, AED has assisted hundreds of colleges and universities in a variety of areas: management and finance, program development, enrollment, executive search, governance, facilities planning and so forth.

On the broader plane, the Academy has sought to identify, survey and analyze those emerging issues in society which are likely to affect higher education directly. In recent years these topics have included the rapid growth of the aging as a segment of our society, and of other non-traditional potential student populations; the rising importance of foreign language and international studies, international negotiations and telecommunications; and the increased importance of applying efficient management techniques to the administration of our financially pressed and underpopulated campuses.

Today, no more pressing an issue confronts our nation's colleges and universities than energy. In helping them meet this challenge, the Academy has been active in a variety of ways. Its Educational Facilities Laboratories Division counsels individual institutions on energy-saving methods, and has also recently published a manual for non-profit institutions on energy conservation, entitled *Energy Management for Human Service Agencies.* The Academy recently conducted a survey of energy conservation ideas developed by colleges and universities, citing the best of them for special $10,000 awards from the Atlantic Richfield Foundation, and publishing the results in *The Energy Conservation Idea Handbook.*

The publication of this comprehensive volume on energy education programs in institutions of higher education marks a milestone in our energy-related efforts. It will serve not only as a prime source of information in the field, but will also hopefully have a stimulating, multiplier effect on other colleges and universities in developing their own unique responses to the energy crisis.

We view the interest and participation of the hundreds of colleges and universities listed in the *Catalog* as one measure of its importance. Another indication of the significance of the project has been the financial support provided by Conoco Inc., Edison Electric Institute and Rockwell International, whose generous aid is much appreciated. Finally, the participation of the American Council on Education with the Academy as co-publisher—the first such joint venture between our two organizations—underscores the magnitude of the issue and of the effort.

Alvin C. Eurich, President
Academy for Educational Development

PREFACE

In an address at Teachers College of Columbia University last year, the Academy for Educational Development's President, Dr. Alvin C. Eurich, persuasively put forth the thesis that the history of American higher education could be best understood in terms of colleges and universities adapting to changing societal needs and demands, rather than stimulating them. If this thesis is correct, then our institutions of higher education have faced no greater challenge in their history than the energy crisis. For no other development in recent history has so fundamentally threatened to undermine our lifestyle and social mores, our economy and financial stability, our international diplomatic and military position and prestige, indeed our very political institutions, as has that of energy, with its skyrocketing prices and dwindling availability.

Colleges and universities are directly affected by the energy situation in two principal ways. First, they are themselves large consumers of energy, and have therefore had to find innovative ways of drastically reducing their consumption and thereby their costs. Determining how they have fared in this regard was the chief object of a previous Academy survey, the results of which were published recently in *The Energy Conservation Idea Handbook* (Washington, D.C.: Academy for Educational Development, September 1980).

But colleges and universities have a far wider impact on the long-range energy awareness and habits of the country by virtue of their essential function as the chief educators of adults in the United States. In the long run, the question of whether the nation's colleges and universities have met the energy challenge successfully or not will be answered in terms of the educational programs they have developed and implemented.

Some time ago, therefore, we at the Academy undertook to find out what America's colleges and universities were doing in the field of energy education. With generous funding from three forward looking industry sources—Conoco Inc., Edison Electric Institute and Rockwell International—we developed a detailed survey questionnaire and mailed it to a representative sample of over 500 colleges and universities of all types in all 50 states and the District of Columbia. In addition, we publicized the survey in a number of key educational publications, including our own *Academy News*, which elicited an even wider range of responses. More than half of the institutions responded, with most indicating that they had indeed developed energy education programs of some type. We subsequently edited the responses according to a standardized format and compiled some 250 entries into this *Catalog*.

The Energy Education Catalog is the first comprehensive reference work to include energy education programs of every description at colleges and universities all across the United States. It describes many formal academic and vocational degree programs in energy, ranging from the associate level and various certificates

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of competency to the bachelor's, master's and even doctoral levels. It also includes informal programs ranging from extension, non-credit, adult education courses to conferences, seminars, and workshops, as well as the providing of information, consulting services, and the conducting of various community service oriented activities.

In using the terms *formal* and *informal* we follow the lead of the institution itself: Those programs which are designated as energy programs per se by their institutions are termed *formal*, while those whose energy activities are more ad hoc or part of other programs are dubbed *informal*. The term *budget* in the listings refers to special energy program budgets, exclusive of faculty salaries and other ongoing costs.

The types of institutions listed in the *Catalog* run the entire gamut of American higher education, from junior and community colleges to small liberal arts colleges to major public and private universities. No one sector of American higher education has a monopoly of creativity or initiative in meeting the energy challenge.

Among the specific types of energy education programs described in the *Catalog* are those in: solar energy and other non-traditional forms (geothermal, wind, biomass, etc.) as well as more conventional energy sources (gas, nuclear, oil and coal); in energy management, environmental studies, engineering, public affairs and other policy-oriented programs; as well as those in law, business management, teacher education, plus various other energy-related activities in the natural and social sciences and the humanities.

In order to be of greatest utility to potential users, the *Catalog* is cross-indexed by the name of the institution, by state and by topic to help the reader find the information quickly. Speaking of readers, we anticipate that the *Catalog* will be read with interest first and foremost in the college and university community itself. Presidents, vice presidents for academic affairs, deans, chairpersons—not to mention faculty members—of relevant departments, business officers, extension division directors, grants officers, plant managers and others can usefully learn from the experience of hundreds of other institutions in establishing energy education programs.

The ultimate consumers of the college or university educational products, the students and potential students, should find the *Catalog* of particular interest. Students who wish to understand the energy situation in general and how it affects their lives; students seeking careers in one of the many growing energy-related fields (solar energy technicians, energy auditors and managers, energy engineers, scientists and researchers, teachers and lawyers); as well as non-traditional students seeking specific energy saving skills (such as home energy con-

servation), will be able to learn where such education is available in their part of the country.

Businessmen and corporations interested in learning where energy-related consultation, advice, information, research and/or educational opportunities are available for themselves or their employees—both in order to make their own businesses more energy efficient and profitable and in order to know which programs are deserving of their corporate support—will find useful guidance here.

Government officials at the federal, state and local levels, and in such departments as energy, education, environmental affairs, commerce and industry, mining, and so on, will be able to find out what programs exist to meet their needs and what programs need and are worthy of funding.

Foundation executives seeking information about educational programs in energy education they may wish to support will find it here.

Obviously, in a rapidly developing field such as energy education, no catalog could hope to be totally accurate or complete at any given moment. Thus, we cannot vouch for the accuracy of the information supplied by the colleges and universities, or even for our representation thereof. Nor do we attempt here to make any evaluation of the individual programs themselves or any overall assessment of the state of energy education. Such an evaluative survey of the state of the art will be found in my article entitled "Achieving Energy Conservation by Educating the Public" in Sidney G. Tickton's (ed.) forthcoming book, *Creative Approaches to Energy Conservation at Colleges and Universities*, to be published for the Academy by Jossey-Bass later this year.

Similarly, some good programs were probably overlooked inadvertently. Indeed, we hope that the publication of the *Catalog* itself will stimulate other institutions to develop their own energy education programs which will then have to be added to the growing list. As such we hope to be able to supplement this *Catalog* periodically, funding allowing. Similarly, we hope to be able to publish an additional catalog listing the many corporate, industry, professional organization and other non-university based energy education programs, some of which we discovered in the course of the present survey.

Before setting out future plans, however, it would do well to acknowledge the assistance of those colleagues and others who aided in compiling and publishing the present *Catalog*. The Academy's President, Dr. Eurich, and its Chief Operating Officer, Stephen F. Moseley, offered encouragement and guidance throughout. Academy Vice President, Sidney G. Tickton, cooperated fully and shared information compiled in his energy conservation survey. My research assistant, Faye Silberberg, worked devotedly and contributed significantly to the project's success. Susan Clark typed and proofed the manuscript and provided other intelligent

and good humored assistance. The cooperation and advice of two key individuals at the American Council on Education, Marcy Massengale, Director of Publications, and Len Boswell, Managing Editor, was much appreciated.

And finally, a vote of thanks is due to the hundreds of college and university administrators and faculty members who took the time and trouble to respond to our detailed questionnaire. We hope the results of our efforts justify their confidence in us.

Gary S. Schiff, Ph.D.
Executive Director
Energy Education Program
Academy for Educational Development

DIRECTORY OF STATES

UNIVERSITY OF ALABAMA IN HUNTSVILLE

Energy-Related Conference

Established January 1980

Contact:
Bernard J. Schroer, Director
Johnson Environmental and Energy Center
University of Alabama in Huntsville
P.O. Box 1247
Huntsville, Alabama 35807
(205) 895-6361

Type of Program: Informal program consisting of a conference coordinated by the Division of Continuing Education and technically supported by the Johnson Environmental and Energy Center

Description/Objective: The principal objective of the "Governor's and Legislature's Conference on Energy" was to educate the Legislature on energy and, specifically, energy in Alabama.

UNIVERSITY OF MONTEVALLO

1. Energy-Related Course
2. Environmental and Energy Education Center
Established Fall 1976

Contact:
D. Charles Carpenter, Director
Environmental and Energy Education Center
University of Montevallo
Montevallo, Alabama 35115
(205) 665-2521, x350

Type of Program:
1. Informal program consisting of one energy-related course offered through the College of Education
2. Formal energy-related program organized as a Center

Description/Objectives:
1. This multidisciplinary methods course is designed to bring greater awareness of environmental education into the classroom and to demonstrate teaching skills in this area.
2. This Center is involved in numerous energy-related activities designed to meet the needs of students and the community, including (1) the production of slide-tape instructional units on the environment, (2) making environmental and energy presentations to civic and school groups, and (3) sponsoring conferences, workshops, and symposia. The Center has sponsored a community forum series entitled "Energy and the Way We Live," two Sun Day programs involving solar and energy conservation displays, and a symposium entitled "Alabama's Natural Resources."

Representative Courses: Environmental Education (College of Education)

Annual Budget: $21,930

KENAI PENINSULA COMMUNITY COLLEGE

Energy Resource Technology Program

Established Spring 1981 (Projected)

Contact:
Ginger Steffy, Department Chairperson
Math and Natural Science Department
Kenai Peninsula Community College
Box 848
Soldotna, Alaska 99669
(907) 262-5801

Type of Program: Formal degree program that is a specialization within the Department of Math and Natural Science

Degrees/Diplomas/Certificates: A.A.S. degree

Description/Objectives: The Energy Resource Technology Program is still in its developmental stages. However, the program aims to achieve the following objectives: (1) the establishment of a source of authoritative knowledge in energy conservation, efficient utilization of resources and practical alternative sources to Alaskans; (2) the provision of assistance to Alaskans in using safe, efficient, alternative renewable sources of energy (3) the application of academic research to working technologies; (4) the provision of vocational training for students; and (5) the development of a source of energy-knowledgeable people to Alaskan business and industry.

Representative Courses:
(1) Survey of Energy Resources (Department of Math and Natural Science)
(2) "Petro-courses" leading to A.A.S. degree

Faculty: 1 FT

Annual Budget: Not established (at this time)

External Funding: State General Fund—$7,600

Research: Research in Petroleum Technology being conducted

Research Funding: General university funds; and grants from various oil companies.

GLENDALE COMMUNITY COLLEGE

Solar Water-Heating System Course

Established Fall 1978

Contact:
Patricia Carter/Georgia Yanez
Glendale Community College
6000 West Olive Avenue
Glendale, Arizona 85302
(602) 934-2211 x227

Type of Program: Informal program consisting of a twelve-hour, noncredit continuing education course

Description/Objectives: The primary objectives of the course are to have each individual student build a solar water-heating collector set and to learn the fundamentals of using it. This class is divided into two workshop sessions. One is a week-day evening session and the other is a full-day session on Saturday.

Representative Courses: See Description/Objectives above

Enrollment: Approximately 60 per month

Faculty: 1 FT, 1 PT

MOHAVE COMMUNITY COLLEGE

Solar Energy Technology Program
Established Fall 1980

Contact:
Vincent M. Salmon, Dean of Instruction
Mohave Community College
1971 Jagerson Avenue
Kingman, Arizona 86401
(602) 757-4331

Type of Program: Formal program leading to a certificate

Degrees/Diplomas/Certificates: Certificate offered upon completion

Description/Objectives: The certificate program in solar energy is primarily designed for the student who wishes to pursue a career in solar energy technology. Upon completion, the student will have basic knowledge of active and passive solar systems, in addition to the testing and maintenance of such systems for hot water heating and cooling. Twenty-eight semester hours are required for the completion of this program.

Representative Courses: Required courses include:
(1) Solar Energy and Systems (Building Trades)
(2) Solar Energy (Science and Math)
(3) Carpentry for Solar Building (Building Trades)
(4) Fabrication of Solar Systems (Building Trades)

Enrollment: 115

Faculty: 1 FT, 3 PT

Student Assistance: Regular scholarships and loans

Annual Budget: $18,000

Related Activities: Energy-related adult education, consumer education and outreach programs are also conducted.

PIMA COMMUNITY COLLEGE

Solar Hot Water Heater Do-It-Yourself Workshop
Established April 1979

Contact:
Constance Howard, Director, Community Services
Pima Community College
219 West Mabel Street
Tucson, Arizona 85705
(602) 884-6569

Type of Program: Formal program consisting of a solar workshop series offered through continuing education

Degrees/Diplomas/Certificates: Certificate of Completion (upon request)

Description/Objectives: This do-it-yourself solar workshop is offered on a monthly basis and consists of a 2½ hour lecture on Friday evening, followed by an all-day workshop for the construction of the solar panels on Saturday. The program, which is open to the community, teaches participants to construct passive solar collectors and, subsequently, convert their hot water heaters.

UNIVERSITY OF ARIZONA

1. Energy Systems Engineering (Graduate)
Established 1972

Contact:
Robert L. Seale, Professor and Head of Nuclear Engineering
Department of Nuclear Engineering
University of Arizona
Tucson, Arizona 85721
(602) 626-2311

Type of Program: Formal interdisciplinary program that is an option at the graduate level within the participating Departments of Nuclear Engineering, Electrical Engineering, Aerospace and Mechanical Engineering, Chemical Engineering and Civil Engineering

Degrees/Diplomas/Certificates: M.S. level

Description/Objectives: Energy Systems Engineering is a coordinated multidepartmental optional graduate program of study and research. If a student decides to take this option, an opportunity will be provided to pursue energy studies and research on a broad scale from the five participating departments. This option is designed to encourage engineering study and research directed toward society's energy needs. The scope of interest includes all energy sources (fossil, geothermal, nuclear, solar, etc.), the systems to convert and transfer energy and power, efficient energy utilization, and appropriate environmental studies.

Representative Courses:
(1) Energy Conversion (Electrical Engineering Department)
(2) Nuclear Reactor Design (Nuclear Engineering Department)
(3) Power Systems Analysis (Aerospace and Mechanical Engineering Department)
(4) Advanced Transport Phenomena (Chemical Engineering Department)
(5) Controlled Thermonuclear Energy (Nuclear Engineering Department)

Enrollment: 40

Faculty: 15 PT

Student Assistance: Regular scholarship program. In addition, one outstanding student scholarship at $500/year.

Research: Topics of research include coal, solar, nuclear, wind, biomass, and geothermal energy fields.

Research Funding: U.S. Department of Energy; Electrical Power Research Institute; Nuclear Regulatory Commission; private industry; and the State of Arizona.

continued

UNIVERSITY OF ARIZONA – continued

2. Energy Engineering (Undergraduate)
Established August 1981 (pending)

Contact:
Robert L. Seale, Professor and Head of Nuclear Engineering
Department of Nuclear Engineering
University of Arizona
Tucson, Arizona 85721
(602) 626-2311

Type of Program: Formal program organized as an autonomous department, with a strong engineering science base

Degrees/Diplomas/Certificates: B.S. level

Description/Objectives: Energy Engineering is an undergraduate program with a strong engineering science base, including design elements in solar, nuclear, biomass, geothermal, and wind applications, as well as supporting courses in the environment and economics. The program is primarily designed to provide undergraduate students with an opportunity to obtain the science, engineering, and economic basis for analyzing energy alternatives on the basis of fuel availability, capital costs and the nature of the demand.

Student Assistance: Regular scholarship program in engineering; other sources pending.

Research: Topics of research are coal, solar, nuclear, wind, biomass, and geothermal energy fields.

Research Funding: U.S. Department of Energy; Electric Power Research Institute; Nuclear Regulatory Commission; private industry; and the State of Arizona.

MISSISSIPPI COUNTY COMMUNITY COLLEGE

Solar Technology Training Program/Solar Photovoltaic Energy System

Established August 1978

Contact:
Earl Stedman
Mississippi County Community College
Blytheville, Arkansas 72315
(501) 762-1020

Type of Program: Formal degree program organized as an autonomous department

Degrees/Diplomas/Certificates: A.A.S. degree

Description/Objectives: This is a two-year program preparing the student in the theory, instrumentation, monitoring, and maintenance of solar heating and cooling systems. The program is primarily a blend of physical science courses and solar engineering technology. A unique opportunity is provided for hands-on experience in this technology as a student in the world's first solar photovoltaic campus. The solar photovoltaic concentrating collector system generates both electricity and thermal energy. Energy from this unit is used to run the school's energy conserving heating, cooling, and lighting systems. In addition, the system is regulated to control the flow of energy as it is needed. This system was funded by a $6.8 million grant from the Department of Energy.

Representative Courses:
(1) Survey of Energy Technology
(2) Solar Technology Cooperative Education
(3) Heating and Air Conditioning Fundamentals

Enrollment: 12

Faculty: 1 FT, 1 PT

Annual Budget: $27,000

External Funding: Federal government—$5,000; state government—$22,000

Related Activities: Adult education seminars in energy deal with the use and abuse of energy conservation and other energy-related matters. In addition, there have been Alcohol Fuel seminars (dealing with the technology and regulation of production) in the area of consumer education.

BUTTE COMMUNITY COLLEGE

Energy-Related Courses and Seminars
Established 1978

Contact:
Raymond D. Carrozza, Chairman
Division of Mathematics, Technology and Telecommunications
Butte Community College
Route 1
Box 183A
Oroville, California 95965
(916) 895-2451

Type of Program: Informal program consisting of energy-related courses and seminars

Description/Objectives: The goals of these energy-related activities include motivating and informing the consumer about conserving energy without substantially changing his/her life style; providing the homeowner with specific knowledge and techniques in order to conserve energy; and training existing construction/contractor professionals in passive and active systems in alternative energy applications. This program's activities include the Solar Energy Seminar, Energy Conservation Seminar/Workshops, and courses covering a variety of energy-related topics.

Representative Courses:
(1) Solar Energy Systems: Design and Applications
(2) Solar Hot Water Systems: Design and Installation
(3) Energy Conservation Principles and Regulations Title 24, Residential

Enrollment: 500

Faculty: 4 PT

CABRILLO COLLEGE

Solar Energy Technology Program
Established 1977

Contact:
Dave Burton, Director, Solar Energy Technology
Cabrillo College
6500 Soquel Drive
Aptos, California 95003
(408) 425-6235

Type of Program: Formal degree program organized as an autonomous department and incorporating support courses in physics

Degrees/Diplomas/Certificates: A.S. degree; Certificate of Proficiency

Description/Objectives: This 31 unit program (minimum) in solar energy technology is composed of courses ranging from 2–4 units. Formats of the courses vary. In addition to lectures, many courses are supplemented by discussion and laboratory sessions. Courses range from the Fundamentals of Solar Energy to Solar Architecture and Solar Remodeling to a course in Solar Electronics, with suggested electives in architectural drafting, environmental studies, horticulture, and physics. One course, Solar Energy-Community Education, designed for the advanced student, disseminates solar information to schools, community groups and fairs in the area. Also, there are Solar Field Studies designed to explore applications of solar energy in industry, commerce, and home residences. Selected field trips and conferences in the western United States are also included in the program.

Representative Courses:
(1) Fundamentals of Solar Energy
(2) Solar Technology and Fabrications
(3) Solar Remodeling

Enrollment: 200

Student Assistance: Teaching assistantships

Annual Budget: $60–80,000

External Funding: State funds—$60–80,000; industry contributions—$5,000

Related Activities: Energy-related consumer education, community activities and outreach programs are also conducted. Solar Energy Community Education (described above) extends the scope of the program to the community.

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

Solar Concentration in Environmental Engineering

Established 1979

Contact:
Malcolm W. Wilson, Associate Vice President for Academic Programs
California Polytechnic State University
San Luis Obispo, California 93407
(805) 546-2247

Type of Program: Formal interdisciplinary program organized as a concentration in Solar Environmental Systems within the Department of Environmental Engineering

Degrees/Diplomas/Certificates: B.S. in Environmental Engineering

Description/Objectives: This program provides students with the opportunity to study the utilization of solar energy as applied to the thermal environment of building interiors and industrial processes. Emphasis is placed on the growing need for trained engineers in the area of solar energy.

Representative Courses: Required courses include:
(1) Solar Energy (Environmental Engineering)
(2) Solar Energy Engineering (Environmental Engineering)
Other courses include:
(1) Energy Science, Research and Development (Aeronautical Engineering)
(2) Introduction to Environmental Design Science (Environmental Design)
(3) Nuclear Reactor Engineering I & II (Mechanical Engineering)
(4) Energy Conversion (Mechanical Engineering)
(5) Energy for the Future (Physics)

Enrollment: 60 **Faculty:** 4 FT

Student Assistance: University Cooperative Education Program with Industry and regular university-wide scholarship program

Research: Extensive and varied applied research is conducted. Much of this research is interdisciplinary, involving teams drawn from agriculture, engineering, architecture, science, and mathematics. Specific solar development projects—"Application of Solar Energy to Industrial Dehydration Processes," "Solar Heated Brooder House," and "'Skytherm' Proof of Concept"—as well as biomass conversion, production of alcohol from waste products, inventory of central California hardwoods, and evaluation of performance of Volkswagen Rabbit utilizing an electric engine are included in the alternate energy areas of research.

Research Funding: U.S. Departments of Energy, Education, and Housing and Urban Development; California Energy Commission; National Science Foundation; and the California Department of Agriculture.

Related Activities: The Electric Power Institute sponsors energy-related short courses, workshops, and conferences.

CALIFORNIA STATE COLLEGE, SAN BERNARDINO

Energy Institute for Elementary and Secondary Teachers

Established Spring 1976

Contact:
Kenneth Mantei, Chairman, Chemistry Department
Lee H. Kalbus, Professor of Chemistry
California State College
5500 State College Parkway
San Bernardino, California 92407
(714) 887-7344

Type of Program: Formal interdisciplinary program organized as an Institute

Description/Objectives: This interdisciplinary program is designed to provide teachers with an opportunity to become aware of efforts to develop our resources of fossil, hydro, and atomic fuels; to extend our resources by more efficient use; to develop alternative energy sources; and to explore the economic, social and political implications of present and future directions. Teaching approaches are developed. The 9-week program is offered as a 5-unit degree applicable extension course and consists of meetings designed as lecture-seminars, at which instructors along with authorities from industry, public utilities, and universities discuss present and potential fuel sources for energy and the implications of this development; as well as of three Saturday field trips to visit operational and experimental power plants in Southern California. Participants are limited to elementary school and secondary science and social science teachers.

Representative Courses:
(1) Energy (Natural Sciences)
(2) Energy and Its Utilization by Man (Natural Sciences)

Enrollment: 30 per session

Student Assistance: Scholarships

Annual Budget: $4,500 per session

External Funding: Southern California Edison Company—$4,500

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Energy Minor & Energy Concentration

Contact:
Kenneth Schneider, Chairman
Department of Mechanical Engineering
California State Polytechnic University, Pomona
3801 West Temple Avenue
Pomona, California 91768
(714) 598-4353

Type of Program: Formal interdepartmental program within the Department of Mechanical Engineering and involving the Departments of Aero Engineering and Chemical Engineering

Degrees/Diplomas/Certificates: B.S. degree

Description/Objectives: Both a minor in energy and a concentration in energy within the Mechanical Engineering major are currently offered. Chief areas included are solar energy, alternative energy sources, and energy management. The purpose of this program is to provide appropriate training in order to qualify mechanical engineers as energy managers, energy analysts, energy auditors and designers.

Representative Courses: Required courses in the Energy Minor are:
(1) Energy Management
(2) Alternative Energy
(3) Nuclear Engineering
(4) Energy Systems Lab
(5) Solar Thermal

Enrollment: 35

CALIFORNIA STATE UNIVERSITY AND COLLEGES

Statewide Energy Consortium
Established 1975

Contact:
Cleve Turner, Director, Statewide Energy Consortium
California State University and Colleges
California State University, Fullerton
Fullerton, California 92634
(714) 773-2106

Type of Program: Formal, statewide, interuniversity consortium including nineteen campuses

Degrees/Diplomas/Certificates: B.A., B.S., M.A., M.S., M. Engr., M.A.T., Ph.D. (awarded by different units of the university for specific programs)

Description/Objectives: This program spans the 19 campuses of the California State University and College system, involving faculty from each unit. Its overall aim is to coordinate and maximize the use of the state's energy expertise, while at the same time allowing each campus to meet its own needs in its own ways. Specifically, the consortium undertakes various joint activities, including: (1) Curriculum development for the state's elementary and secondary schools; (2) Conferences on major energy issues, such as cogeneration, involving participants from academia, government and industry; (3) Teacher education programs; (4) Technical assistance to both the public and private sectors; (5) Encouragement of the development of alternative energy design ideas by administering the federal Appropriate Energy Technology Small Grants Program for California. The 19 constituent institutions include the campuses at: Bakersfield, Chico, Dominguez Hills, Fresno, Fullerton, Hayward, Humboldt,* Long Beach, Los Angeles,* Northridge,* Pomona,* Sacramento, San Bernardino,* San Diego,* San Francisco,* San Jose,* San Luis Obispo,* Sonoma* and Stanislaus. Institutions with an asterisk* are listed separately in this catalog. In addition CSU/Dominguez Hills has an interdisciplinary Minor in Energy Studies and is planning an Extended Program Certificate in Population, Resources, Energy and the Environment; Long Beach is planning a Certificate Program in Energy Conversion and Power systems; while Pomona is planning to add a Petroleum Engineering Option to its Mechanical Engineering Program.

Enrollment: 850 teachers participated in fourteen workshops across the state; they in turn exposed their 127,500 students to energy education classwork.

Faculty: Over 8,000 faculty members (scientists, engineers, sociologists, political scientists, economists, environmentalists and others) from nineteen campuses.

Annual Budget: over $700,000 since 1975

External Funding: 18 corporations, including major California utilities—$400,000; California Energy Commission—$174,950 (for curriculum materials); U.S. Department of Energy—$169,655 (for Appropriate Technology Program)

CALIFORNIA STATE UNIVERSITY, LOS ANGELES
Energy-Related Courses

Contact:
Linda Trevillian, Administrative Assistant
California State University
5151 State University Drive
Los Angeles, California 90032
(213) 224-3305

Type of Program: Informal interdisciplinary program consisting of energy-related courses at the undergraduate and graduate levels

Degrees/Diplomas/Certificates: B.S. in Engineering; M.S. in Engineering levels

Description/Objectives: These courses cover a variety of energy-related topics and are offered through the Departments of Geology, Physics, Electrical Engineering, and Mechanical Engineering.

Representative Courses: Undergraduate courses include:
(1) Economics for Engineers
(2) Thermal Systems Laboratory
(3) Air Conditioning
(4) Power Plants
Graduate courses include:
(1) Process Mass and Heat Transfer
(2) Power System Stability
(3) Coastal Engineering

Research: Topics of research include lead isotopes in groundwater; thermal analyses of coal; solar energy conversion in residential systems; heat exchanger technology for geothermal energy sources; and the photoelectrical properties of semiconducting materials.

Research Funding: Bendix Corporation; U.S. Department of Energy; and NASA.

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE
Energy-Related Courses

Contact:
Gerald Prescott, Office of Academic Programs
California State University, Northridge
18111 Nordhoff Street
Northridge, California 91330
(213) 885-2134

Type of Program: Informal interdisciplinary program consisting of energy-related courses in the Departments of Engineering, Physics, Geological Sciences, Home Economics, and Economics

Degrees/Diplomas/Certificates: B.A.; B.S.; M.A.; and M.S. levels

Description/Objectives: These courses deal directly with energy themes and cover a variety of energy-related topics.

Representative Courses:
(1) Energy and Society (Engineering)
(2) Energy: Prospects and Alternatives (Physics)
(3) Economic Geology (Geological Sciences)
(4) Consumer Issues and Problems (Home Economics)
(5) Environmental Economics (Economics)

Faculty: 5 FT; 5 PT

Research: Studies related to solar energy at the University's San Fernando Observatory, and research in wind-generated energy

Research Funding: California Energy Commission and University funds

Related Activities: Extension courses such as Teaching About Energy, How to Build a Practical Solar Energy System, Solar Energy for Homeowners, and Consumer Issues and Problems are also conducted.

CHABOT COLLEGE

Solar Energy Courses

Contact:
Robert N. Brown, Chairman
Division of Technology-Engineering
Chabot College
25555 Hesperian Boulevard
Hayward, California 94545
(418) 786-6849

Type of Program: Informal program consisting of courses within the Division of Technology-Engineering

Description/Objectives: Courses relate primarily to the area of solar energy and cover a variety of topics including the relationship of solar energy to the individual, solar architecture and heating fundamentals. These courses are offered through the Division of Technology-Engineering.

Representative Courses:
(1) Solar Architecture
(2) Solar Energy and You
(3) Solar Heating Fundamentals

Enrollment: 15

Faculty: 1 PT

Student Assistance: Regular assistance

External Funding: State funds; local property taxes

CITRUS COLLEGE

Energy-Related Courses

Contact:
Leo M. Thomas, Vice President for Instruction
Citrus College
18824 E. Foothill Boulevard
Azusa, California 91702
(213) 335-0521

Type of Program: Informal program consisting of energy-related courses within the Physical Sciences Department

Description/Objectives: This informal program of energy-related courses examines alternative sources of energy, with a special emphasis on solar energy.

Representative Courses:
(1) Alternate Sources of Energy
(2) Solar Energy

Enrollment: 55

Faculty: 2 PT

COASTLINE COMMUNITY COLLEGE

Energy Management Certificate Program
Established June 1979

Contact:
A. Samuel Martinez, Associate Dean
Coastline Community College
10231 Slater Avenue
Fountain Valley, California 92708
(714) 898-9871

Type of Program: Formal occupational certificate program

Degrees/Diplomas/Certificates: A.A.; Certificate

Description/Objectives: This program is intended to reach the middle management person. It is designed to train students in making competent evaluations in areas such as energy forms and sources, and in making energy management decisions such as buying new equipment and when to retrofit. A certificate is given upon fulfilling the program requirements, and an A.A. degree is awarded upon fulfilling additional degree requirements.

Annual Budget: $8,000

COGSWELL COLLEGE

Energy-Related Courses
Established 1976

Contact:
Ron Miller
Cogswell College
600 Stockton Street
San Francisco, California 94108
(415) 433-5550

Type of Program: Informal program consisting of energy-related courses that are part of formal degree programs

Description/Objectives: Informal program consisting of energy-related courses within the degree granting programs of Architecture, Civil Engineering Technology and Mechanical Engineering Technology. These courses have common goals of providing an awareness of energy problems and proposing solutions.

Representative Courses:
(1) Energy Concepts (Architecture Department)
(2) Solar Energy Applications (Civil Engineering Technology Department)
(3) Energy Resources and Utilization (Mechanical Engineering Technology Department)
(4) Environmental Science (Science Department—a requirement for Architecture)

Enrollment: 24

Related Activities: Energy-related adult education and extension courses are also conducted.

COLLEGE OF MARIN

Energy Audit Training Program
Established June 1979

Contact:
Dick Rodgers; Don Martin, Directors
Energy Audit Training Program
College of Marin
Kentfield, California 94904
(415) 485-9549 or 9510

Type of Program: Formal program consisting of a certificate-bearing training course within the Energy Science Department

Degrees/Diplomas/Certificates: Certification

Description/Objectives: This course consists of three days of eight hours of instruction per day. Areas of instruction include: preventive maintenance, heating ventilating and air conditioning, building envelope studies, case histories of a working energy conservation program, alternate energy sources, and calculations of energy-saving potential. The program is designed to train energy auditors for work performed in federal and state combined grant-loan programs for energy audits and in energy conservation endeavors for schools and hospitals.

Enrollment: 350

External Funding: State funds

COLLEGE OF THE SISKIYOUS

Appropriate Technology Program

Established June 1980

Contact:
Gary Peterson, Vice President
College of the Siskiyous
800 College Avenue
Weed, California 96094
(916) 938-4463

Type of Program: Formal program offered within the Natural Resources Department

Degrees/Diplomas/Certificates: A.A. level

Description/Objectives: Appropriate Technology refers to those technologies that enable individuals to conserve natural resources, and manage them at minimal costs in ways most in tune with the natural environment. The emphasis of the program is to teach self-reliance. Courses are offered during the regular semester, in special summer institutes, on week-ends, etc. The opportunity is provided for students and faculty to conduct research in a variety of energy-related areas.

Representative Courses:
(1) Solar Systems
(2) Wind and Hydroelectric Power
(3) Alcohol Fuel Production
(4) Alternative Energy

Faculty: 1+ FT

Annual Budget: $97,000

External Funding: Federal government—$57,000; state government—$40,000

Research: Ethanol production; geothermal energy

Research Funding: U.S. Department of Energy

Related Activities: Energy-related consumer education, adult education and community activities are also conducted.

COLUMBIA COLLEGE

Alternative Energy Sources Course
Established 1979

Contact:
John C. Menzie
Columbia College
Box 1849
Columbia, California 95310
(209) 532-3141

Type of Program: Informal program consisting of one course within the Department of Natural Resources

Description/Objectives: This short-term, two-quarter program, which is a specialization within the Department of Natural Resources, deals with the cause and effect relationships of the energy crisis. The program includes practical applications of solar, wind, water, methane and geothermal energy.

Representative Course:
Natural Resources

Enrollment: 50

Faculty: 1 PT

Related Activities: Energy-related adult education, consumer education, senior citizen programs, and community activities are also conducted.

DE ANZA COLLEGE

Solar Energy Courses
Established 1979–80

Contact:
Les Schwoof, Dean of Engineering and Technology
De Anza College
Cupertino, California 95014
(408) 996-4772

Type of Program: Informal program consisting of energy-related courses within the Department of Industrial Technology

Description/Objectives: This program is directed to the layperson to provide a broad basis for understanding the various aspects of solar energy and the implications of its use, particularly from the vantage point of the consumer.

Representative Courses:
(1) Solar Energy for the Consumer (Industrial Technology)
(2) Solar Energy for the Homeowner (Industrial Technology)

Enrollment: 80

HARVEY MUDD COLLEGE

Energy Institute
Established September 1980

Contact:
B. Samuel Tanenbaum, Dean of Faculty
Harvey Mudd College
Claremont, California 91711
(714) 621-8122

Type of Program: Formal program that is an interdepartmental concentration involving the Departments of Engineering, Chemistry, Physics and Mathematics, and organized as an Institute

Degrees/Diplomas/Certificates: B.S. level and Master of Engineering level

Description/Objectives: One of the primary purposes of the Institute is to provide a suitable setting for focused energy research and for the informal discussion of energy policy. Other objectives are: (1) to develop energy-related instructional materials concerning the technical, engineering, scientific and social aspects of world energy supply for inclusion in the existing curriculum; (2) to stimulate energy-related research within each of and among the academic departments; and (3) to produce or sponsor seminars and/or other public programs on energy-related issues.

Representative Courses:
(1) Engineering Clinic (Engineering Department)
(2) Energy and Environment (Engineering Department)

Faculty: 1 FT; 5–10 PT (anticipated)

Annual Budget: $100,000 (anticipated)

External Funding: Corporations

Research: Engineering

Research Funding: College; federal government; and corporations.

Related Activities: Energy-related community activities are also conducted.

HUMBOLDT STATE UNIVERSITY

Energy-Related Courses

Contact:
Whitney Buck, Dean, Undergraduate Studies
Humboldt State University
Arcata, California 95521
(707) 826-4192

Type of Program: Informal program of energy-related courses offered through several departments

Description/Objectives: These courses offer students electives from which a special major might be pursued (subject to limitations of degree requirements) that focuses study on a number of energy concerns. A variety of energy-related courses are offered through the Departments of Chemistry, Physics, Geology, Economics, Political Science, Sociology, Business Administration, Natural Resource Planning and Interpretation, Industrial Arts, Natural Resources Planning and Interpretation, Engineering, and Environmental Resources Engineering. A major objective of these offerings is to increase students' awareness of the nature, sources, applications, and problems associated with energy.

LA VERNE COLLEGE

Energy-Related Courses

Contact:
La Verne College
1950 Third Street
La Verne, California 91750
(714) 593-3511

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: These courses cover a variety of energy-related topics and involve the Humanities, Natural Sciences, and Social Sciences.

Research: The National Energy Research and Information Institute (an affiliate of the College) publishes a monthly newsletter, Energy Report, which focuses on the energy situation.

LOS ANGELES VALLEY COLLEGE

Solar Energy Technology Program
Established September 1980

Contact:
Jay H. Glassman, Chair, Engineering Department
Engineering Department
Los Angeles Valley College
5800 Fulton Avenue
Van Nuys, California 91401
(213) 781-1200

Type of Program: Formal program that is a specialization within the Department of Engineering

Degrees/Diplomas/Certificates: Certificate of Completion

Description/Objectives: The basic objective of the program is to provide knowledge of present solar systems and components.

Representative Courses:
(1) Solar Energy I (Engineering)
(2) Solar Energy II (Engineering)
(3) Man and His Environment (Environmental Sciences). A major portion of this course is devoted to energy issues.

Faculty: 1 FT, 1 PT

Related Activities: Energy-related consumer education activities such as energy audits and an Energy Fair have been conducted.

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MONTEREY PENINSULA COLLEGE

Solar Technician's Program

Contact:
Phillip Nash, Dean, Instructional Planning
Monterey Peninsula College
980 Fremont Boulevard
Monterey, California 93940
(408) 649-1150 x338

Type of Program: Formal interdisciplinary program involving the Departments of Construction Technology, Electronics, and Drafting

Degrees/Diplomas/Certificates: Solar Technician's Certificate of Completion

Description/Objectives: This program was created to train solar technicians. In addition, there is a special intensive course set up to train those who are CETA eligible. The program is designed specifically to meet the future needs of the community and solar businesses.

Enrollment: 20

Faculty: 1 FT

Student Assistance: CETA allowances

Annual Budget: $400,000

External Funding: CETA—$400,000

Related Activities: A series of Alternative Energy workshops are conducted.

MT. SAN JACINTO COLLEGE

Energy-Related Courses
Established Spring 1977

Contact:
Benton Caldwell, Dean of Vocational Education
Mt. San Jacinto College
21400 Highway 79
San Jacinto, California 92383
(714) 654-7321

Type of Program: Informal program consisting of solar-related courses offered through the Department of Engineering

Degrees/Diplomas/Certificates: Certificate (proposed)

Description/Objectives: These solar-related courses are designed to teach solar energy applications and systems design for home and commercial use.

Representative Courses:
(1) Solar Energy Applications
(2) Solar Collector Design
(3) Solar Systems Design

Enrollment: 46

Faculty: 2 PT

Related Activities: A solar energy system project that produces alcohol has been in operation for two years and involves senior citizens from the community. Solar energy seminars and fairs have also been conducted.

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SAN DIEGO STATE UNIVERSITY

1. Energy-Related Courses
2. Institute for Energy Studies (projected)

Contact:
Alan Sweedler, Professor of Physics
San Diego State University
College of Sciences
San Diego, California 92182
(714) 265-6155

Type of Program:
1. Informal interdisciplinary program consisting of energy-related courses involving the Natural Sciences, Social Sciences, and Humanities.
2. Formal program to be organized as an Institute.

Degrees/Diplomas/Certificates: B.S.; M.S. levels

Description/Objectives:
1. These courses, offered primarily in the Natural Sciences, cover a variety of energy-related topics, including nuclear energy and energy conservation.
2. The projected Institute is designed to stimulate, facilitate, and promote the development of research and academic programs in various aspects of energy-related studies, with particular emphasis given to the energy concerns of San Diego County.

Representative Courses:
(1) Current Topics in Energy Research (Physics)
(2) Energy and Conservation (Physics)
(3) Nuclear Energy (Physics)

Enrollment: 1. 73

Research: Solar thermal, photovoltaic, geothermal, oil exploration, energy policy, and cogeneration of electricity via saline pond-ranking cycle turbine with secondary use of waste heap

Research Funding: Federal government; commercial investment; University funds; and the government of Mexico.

SAN FRANCISCO STATE UNIVERSITY

Energy Conservation Courses
Established 1978

Contact:
Leo Dunne, Energy Management Engineer
Plant Operations
San Francisco State University
1600 Holloway Avenue
San Francisco, California 94132
(415) 469-2769

Type of Program: Informal subprogram consisting of energy-related courses in the Department of Engineering and the Department of Design and Industry

Description/Objectives: The primary objective of these courses is to disseminate information about energy consumption and conservation techniques. To that end, a variety of issues and topics are dealt with that include solar energy, nuclear energy, and conservation measures.

Representative Courses:
(1) Exploring Solar Technology (Design and Industry)
(2) Exploring Nuclear Energy (Design and Industry)
(3) Introduction to Energy Technology (Design and Industry)
(4) Energy Conservation Measures (Engineering)
(5) Direct Energy Conversion (Engineering)

Enrollment: 158

Faculty: 1 FT, 4 PT

Student Assistance: Regular scholarships based on need

Related Activities: Energy-related extension courses are also conducted.

SAN JOSE STATE UNIVERSITY
Environmental Studies Program

Contact:
Gary Klee, Coordinator
Environmental Studies Program
San Jose State University
San Jose, California 95192
(408) 277-2940

Type of Program: Formal degree program affiliated with the School of Social Sciences and organized as an autonomous department

Degrees/Diplomas/Certificates: B.A. in Environmental Studies with Social Sciences or Humanities Concentration; B.A. in Environmental Studies with Natural Science Concentration; B.S. in Environmental Studies with Environmental Technology of Management Concentration; B.S. in Mechanical Engineering; M.S. in Mechanical Engineering

Description/Objectives: Environmental Studies is designed to provide education and enrichment in the areas of environmental awareness and problem solving. This program offers analyses of the social, political, economic and cultural implications of resource management and ecological problems, as well as a technical component. Students may either elect one of the degree programs or minor in Environmental Studies. In addition, the Department of Mechanical Engineering offers an energy focus on both undergraduate and graduate levels.

Representative Courses:
(1) Resources for the Future (Environmental Studies)
(2) Solar Energy Theory and Applications (Environmental Studies)
(3) Energy and the Environment (Environmental Studies)
(4) Energy Policy Analysis (Environmental Studies)
(5) Solar Energy Workshop (Environmental Studies)
(6) Simple Living in Urban Homes (Environmental Studies)
(7) Advanced Solar Energy Theory (Environmental Studies)

Enrollment: 124

Faculty: 3 FT, 6 PT

Student Assistance: Environmental Information Center

Related Activities: Energy-related extension courses offered through Environmental Studies are: (1) Energy and Environmental Controversies: Classroom Approaches; (2) Environment and Man in Transition; (3) Human Ecology; (4) Environmental Economics and Policy; (5) Environmental Law and Application; (6) California Environmental Controversy and (7) Environmental Education for Teachers.

SIERRA JOINT COMMUNITY COLLEGE

Energy Management Technician Program

Established September 1979

Contact:
Nancy Berman, Chairman, Business/Technical Education Division
Sierra Joint Community College
5000 Rocklin Road
Rocklin, California 95667
(916) 624-3333

Type of Program: Formal degree/certificate program in energy management

Degrees/Diplomas/Certificates: A.A.; A.S.; and Certificate

Description/Objectives: This program is designed to (1) provide students with technical competencies for employment in the capacity of either energy manager or technician; (2) upgrade skills of those already employed in positions of building maintenance, facilities control, or energy consumption control; and (3) provide energy consumers with the competencies to reduce energy use in their own lives.

Representative Courses:
(1) Energy Management Principles
(2) Applied Energy Economics
(3) Energy Management and Human Behavior

Enrollment: 100

Annual Budget: $6,000

SOLANO COMMUNITY COLLEGE

Energy-Related Courses
Established September 1979

Contact:
Donald Obendorf, Drafting Instructor
Solano College
P.O. Box 246
Suisun City, California 94585
(707) 864-7000

Type of Program: Informal program consisting of energy-related courses within the Drafting Department

Description/Objectives: Courses are given in the areas of both energy conservation and solar energy. The primary purpose of both these offerings is to provide insights into energy saving methods and design.

Representative Courses:
(1) Energy Conservation and Design (Drafting)
(2) Passive Solar Design (Drafting)

Enrollment: 60

Faculty: 2 FT

Annual Budget: $10,000

SONOMA STATE UNIVERSITY

Energy Plan Specialization
Established 1976

Contact:
Joe E. Armstrong, Solar Center
Sonoma State University
1801 East Cotati Avenue
Rohnert Park, California 94928
(707) 664-2577

Type of Program: Formal interdisciplinary program organized as a specialization within the Environmental Studies Department

Degrees/Diplomas/Certificates: B.A.

Description/Objectives: This Energy Plan exists within the context of Environmental Studies curriculum to provide knowledge of energy supply technologies and the political means for their development and control. Architectural design aspects for energy conservation and detailed experience in direct solar design are included. This energy specialty is intended as an integral part of the Environmental Studies two-year curriculum (Junior Senior level), with an emphasis on solar design.

Representative Courses: Required courses are:
(1) Solar Energy Direct Uses
(2) Advanced Solar Seminar
(3) Senior Project or Internship
Other courses are:
(1) Fundamentals of Energy Use
(2) Energy Policies and Politics
(3) Architectural Design and Energy Efficiency

Enrollment: 60 undergraduate; 10 graduate

Faculty: 3 PT

Student Assistance: Work-study and assistantships to work in on-campus solar center

Related Activities: Energy-related extension courses are also conducted.

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UNIVERSITY OF CALIFORNIA, DAVIS

Energy-Related Courses

Contact:
University of California at Davis
Davis, California 95616
(916) 752-1011

Type of Program: Informal interdepartmental program consisting of energy-related courses

Description/Objectives: These courses involve various engineering departments of the University, the Division of Environmental Studies, and the Physics Department and cover a variety of energy-related issues.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Course by Newspaper: Energy and the Way We Live
Established January 1980

Contact:
George A. Colburn, Project Director, Course by Newspaper
University of California, San Diego
University Extension, X-002
La Jolla, California 92093
(714) 452-3405

Type of Program: Formal, interdisciplinary, nationwide program offered by a variety of departments in participating institutions

Description/Objectives: The course by newspaper was developed to reach the broadest audience possible with a variety of viewpoints and perspectives from different disciplines. Energy and the Way We Live is designed to explore the wide-ranging dimensions of the U.S. energy debate by focusing on the nature and character of the energy crisis and the implications it has on lifestyle. The course is divided into four major sections; (1) The Current Energy Dilemma; (2) Lessons From the Past: Problems, Solutions, and More Problems; (3) Energy and Values; and (4) Alternative Scenarios for Our Energy Future. Colleges and universities participating in this course by newspaper offer credit locally. Credit hours and the kind of credit—curriculum and/or continuing education—are determined by the local institution. This newspaper series, carried by 540 newspapers, and a Reader/Study Guide form the basis for the courses offered by 362 colleges and universities across the country.

Annual Budget: $195,000

External Funding: National Endowment for the Humanities, and National Science Foundation

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UNIVERSITY OF SOUTHERN CALIFORNIA

Energy-Related Courses

Contact:
Dick Olsen, Assistant to the Dean of Engineering
University of Southern California
ADM 350
Los Angeles, California 90007
(213) 743-5070

Type of Program: Informal program consisting of energy-related courses within the Department of Mechanical Engineering

Description/Objectives: These courses cover a variety of energy-related topics, including energy alternatives.

Representative Courses:
(1) Energy Alternatives
(2) Solar Energy Conversion Systems

Related Activities: The Schools of Engineering and Education, under contract to the U.S Department of Energy, have developed a solar energy curriculum for grades K-6 for distribution to schools across the country as well as to several foreign countries.

UNIVERSITY OF SOUTHERN CALIFORNIA–IDYLLWILD CAMPUS

Energy-Related Course

Established 1978

Contact:
Carol Bass, Coordinator
University of Southern California—Idyllwild Campus
P.O. Box 38
Idyllwild, California 92349
(714) 659-2171

Type of Program: Informal program consisting of one energy-related course

Description/Objectives: This program is designed to reduce energy costs in growing food and heating buildings by using an active/passive solar greenhouse. It is directed toward the education of people on a fixed income. Energy savings and methods of implementation are taught on a continuing basis to people on a fixed income as well as to students enrolled in the program through the Wilderness Semester beginning in 1981.

External Funding: Private donations

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TAFT COLLEGE

Energy-Related Political Science Course
Established January 1980

Contact:
Dara Kennedy, Special Projects Coordinator
Taft College
29 Emmons Park Drive
Taft, California 93268
(805) 765-4191

Type of Program: Informal program consisting of one energy-related course in the Department of Political Science

Description/Objectives: This course in energy covers a variety of topics surrounding the "energy dilemma."

Representative Course:
Contemporary Political Ideas: The Energy Dilemma (Political Science)

Related Activities: A series of three energy-related public forums was conducted.

WEST VALLEY COMMUNITY COLLEGE

Facilities Auditors Training Course

Established August 1977

Contact:
Gerald V. Sharp, Director, Educational Development
West Valley Community College
44 East Latimer Avenue
Campbell, California 95008
(408) 866-6499

Type of Program: Informal program consisting of one energy-related course

Degrees/Diplomas/Certificates: Certification

Description/Objectives: The goal of this course is to train local facilities managers and their staffs to conduct the U.S. Department of Energy mandated audits.

Annual Budget: $120,000

External Funding: U.S. Department of Energy, Energy Extension Service

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ARAPAHOE COMMUNITY COLLEGE

Energy Conservation Technology Program

Contact:
Gene Amoroso, Director of Vocational Education
Arapahoe Community College
5900 South Santa Fe Drive
Littleton, Colorado 80120
(303) 794-1550 x404

Type of Program: Formal program that is a specialization within the Department of Applied Technology

Degrees/Diplomas/Certificates: Certificate in Energy Conservation Technology

Description/Objectives: This program is designed for persons employed in a variety of management, supervisory, technical, maintenance and related positions involved in energy conservation planning and operations. Included in the program is a study of buildings, energy sources, energy systems, short- and long-range conservation applications and current issues affecting energy planning.

Representative Courses:
(1) Energy Sources and Consumption
(2) Introduction to Passive Solar Energy
(3) Long-Term Energy Conservation Solutions
(4) Energy Systems
(5) Energy Calculation and Analysis
(6) Energy Control and Management

Enrollment: 20

Faculty: 1 FT

Student Assistance: Regular financial assistance

Related Activities: An Energy Laboratory, used both by the college program and by the Colorado Energy Office as an Energy Extension Service, is maintained.

TRINIDAD JUNIOR COLLEGE

Mining Technology and Solar Technology Courses

Contact:
Leonard Hawley, Dean, Occupational Education
Trinidad Junior College
Trinidad, Colorado 81082
(303) 846-5631

Type of Program: An interdisciplinary program, consisting of formal courses plus informal workshops and short courses, which is primarily a specialization within the Department of Occupational Education

Degrees/Diplomas/Certificates: A.A.; Certificate

Description/Objectives: The objectives of the program are to meet the needs of the area's coal mines for training of personnel in mining technology, as well as to meet the needs of the building trades and of drafting by teaching solar applications and energy conservation.

Representative Courses:
(1) Mining Technology
(2) Solar Application

Faculty: 3 FT, 4 PT

Student Assistance: BEOG; Work Study

Related Activities: Summer energy workshop, "Build with Adobe/Heat with the Sun" is conducted in cooperation with Alternatives of Southern Colorado, Inc. Scholarships based on need are available for this workshop.

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UNIVERSITY OF DENVER

Energy Resource Management Program
Established September 1979

Contact:
John P. Byrden, Director, Energy Resource Management Program
College of Business Administration
University of Denver
University Park
Denver, Colorado 80208
(303) 753-2698

Type of Program: Formal graduate program offered within the College of Business Administration

Degrees/Diplomas/Certificates: M.B.A.

Description/Objectives: The MBA/Energy Resource Management program is designed to provide the student with a basic understanding of alternative energy resources, international and domestic political problems, problems of exploration and development, financing of energy development, and administrative and political processes as they relate to the regulation of energy. Graduates of this program may seek employment in energy-user industries as well as in energy-producer industries.

Representative Courses:
(1) Energy Resource Management (Energy Program)
(2) Energy Resource Finance (Finance)
(3) Conservation and Issues of Energy Demand (Energy Program)
(4) Extractive Industries Accounting (Accounting)
(5) Environmental and Energy Systems (Administrative Sciences)

Enrollment: 25

Faculty: 1 FT, 5 PT

Student Assistance: Scholarships and graduate assistantships, as well as both private and public organization internships, that provide opportunities to perform research for energy-related industries

External Funding: Corporate funding

Research: Research into development, management and alternative sources is conducted by the Denver Research Institute (a part of the University), in addition to Law School programs in Natural Resource Law.

Research Funding: Federal; state; and private.

UNIVERSITY OF NORTHERN COLORADO

Energy-Related Courses

Contact:
Theresa M. Malumphy, Assistant Vice President, Academic Development
University of Northern Colorado
Academic Affairs—Fraiser 205
Greeley, Colorado 80639
(303) 251-2823

Type of Program: Informal program consisting of energy-related courses

Description/Objectives: The courses offered cover a variety of areas including physics, earth science and chemistry, in addition to environmental studies. The purpose of this informal program is to educate students in energy-related matters.

Representative Courses:
(1) Energy and the Environment
(2) Reactors and Radiation
(3) Economics of Natural Resources
(4) Natural Resources and Technology
(5) Solar and Alternative Power Systems

Enrollment: 60

Student Assistance: General state aid; Work Study

WESTERN STATE COLLEGE OF COLORADO

Energy-Related Courses

Contact:
Jerome J. Kowal, Instructor
Industrial Arts Department
Gunnison, Colorado 81230
(303) 943-2004

Type of Program: Informal program consisting of solar-related courses offered through the Industrial Arts Department

Description/Objectives: These energy-related courses cover a variety of topics in relation to solar energy.

Representative Courses:
(1) Alternate Energy Sources: A Solar Perspective
(2) Workshop in Industrial Arts: Solar Energy

Related Activities: A Conference on Energy was also conducted.

CENTRAL CONNECTICUT STATE COLLEGE

Energy-Related Courses
Established 1977

Contact:
Edward H. Keeter, Assistant Professor
Industrial Technology Department
Central Connecticut State College
1615 Stanley Street
New Britain, Connecticut 06050
(203) 827-7414

Type of Program: Informal interdepartmental program consisting of energy-related courses

Description/Objectives: The major objectives of these courses is to provide students enrolled in the Sciences or Industrial Technology with both knowledge and experience in the area of solar energy. Energy-related courses are given by the Physics and Earth Sciences, Industrial Education and Industrial Technology Departments.

Representative Courses:
(1) Introduction to Solar Energy (Physics and Earth Science)
(2) Earth Energy and Environment (Physics and Earth Science)
(3) Introduction to Energy Processing (Industrial Education) (Required of Industrial Education and Industrial Technology majors)
(4) Architectural Planning I (Industrial Technology) (Required of Industrial Technology and Construction majors)

Enrollment: 354

Faculty: 4 FT

External Funding: State

Related Activities: Seminars are planned, starting in 1981, for the general public, including people in small industries and homeowners who wish to retrofit their facilities for the use of solar energy.

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CONNECTICUT COLLEGE

Energy-Related Courses

Contact:
Jane R. Bredeson, Assistant to the President
Connecticut College
270 Mohegan Avenue
New London, Connecticut 06320
(203) 442-5391

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: Energy-related courses are given in the Departments of Chemistry, Economics, Government, Human Ecology and Physics. Topics cover a variety of areas, from Energy Sources (Physics Department) to a Seminar in Natural Resource Economics (Economics Department).

Representative Courses:
(1) Issues of Contemporary Science (Chemistry)
(2) Perspectives in Energy (Chemistry)
(3) Problems of Environmental Policy and Law (Government)
(4) Natural Resources Policy (Government)
(5) Environmental Economics (Economics)
(6) Seminar in Natural Resource Economics (Economics)
(7) Ecology and Man (Human Ecology)
(8) Field Work in Environmental Education (Human Ecology)
(9) Energy Sources (Physics)

Related Activities: An Environmental Model Committee composed of faculty, students, and administrators has been organized to monitor energy conservation efforts on campus.

ST. JOSEPH COLLEGE
Teacher Training Courses

Contact:
Claire Markham, Assistant Dean, Graduate Division
St. Joseph College
1678 Asylum Avenue
West Hartford, Connecticut 06117
(203) 232-4571, x205

Type of Program: Informal program consisting of in-service and pre-service teacher-training energy-related courses

Description/Objectives: These courses cover a variety of energy-related topics, such as solar energy, nuclear energy, and energy conservation.

Related Activities: Energy-related conferences and workshops have also been conducted.

DELAWARE STATE COLLEGE

Energy-Related Course

Contact:
Ehsan Helmy, Chairman, Physics Department
Delaware State College
Dover, Delaware 19901
(302) 736-5158

Type of Program: Informal program consisting of one energy-related course in the Physics Department

Description/Objectives: This course approaches the study of energy from a physical point of view.

Representative Course:
Energy (Physics)

Enrollment: 10

External Funding: Advanced Institutional Development Program, Title III—$8,000

Research: Research focuses on solar energy and biomass.

Research Funding: U.S. Department of Energy

UNIVERSITY OF DELAWARE

1. Energy-Related Courses, Seminars, and Research
2. Institute of Energy Conversion

Contact:
Margaret D. Stallings, Manager
Energy Management and Communications
Institute of Energy Conversion
University of Delaware
One Pike Creek Center
Wilmington, Delaware 19711
(309) 995-7155

Type of Program:
1. Informal interdisciplinary program consisting of energy-related courses, seminars, and research
2. Nonacademic research division of the University

Degrees/Diplomas/Certificates: A Seminar in Design of Residential and Solar Systems offers a Certificate of Completion and continuing education units from the University.

Description/Objectives:
1. The energy-related courses involve the Departments of Electrical Engineering, Mechanical and Aerospace Engineering and Political Science, with primary emphasis on solar energy.
2. The Institute of Energy Conversion conducts solar energy research and sponsors various seminars and workshops in energy-related areas.

Representative Courses:
(1) Energy Systems (Electrical Engineering)
(2) Photovoltaic Solar Cells (Electrical Engineering)
(3) Solar Thermal Conversion (Mechanical and Aerospace Engineering)
(4) Environmental Policy and Administration (Political Science)

Enrollment: 110

Student Assistance: Summer research interns; student cooperative program with the College of Business and Economics

Research: Research in the area of solar energy

Research Funding: Federal and state grants

Related Activities:
(1) Solar Installation Training Workshops—a summer workshop designed for building contractors, engineers and skilled tradespersons.
(2) Design of Residential Solar Systems Seminar—developed for architects, engineers, builders and planners involved in the design of solar systems for residential buildings.

GEORGETOWN UNIVERSITY

National Coal Policy Project

Established January 1977

Contact:

Francix X. Murray, Director, National Energy Program
The Center for Strategic and International Studies
Georgetown University
1800 "K" Street, N.W.
Washington, D.C. 20006
(202) 887-0200

Type of Program: Informal program organized to study the use of coal

Description/Objectives: This program is designed primarily to bring together industrial and environmental leaders to solve the problems related to the use of coal. Problems are given to particular "task forces" composed of experts in a particular field. Recommendations are often made and sent to an appropriate agency for consideration.

External Funding: Foundation grants; government funds; and industrial sources

GEORGE WASHINGTON UNIVERSITY

Energy Emphasis

Contact:
Ali Campbell, Professor of Engineering and Applied University Science
George Washington University
Washington, D.C. 20052
(202) 676-7135

Type of Program: Formal graduate program which is an emphasis in the engineering program

Degrees/Diplomas/Certificates: M.S. in Engineering, emphasis in energy; Ph.D. in Engineering, emphasis in energy

Description/Objectives: This concentration in energy covers a variety of energy-related issues such as solar and nuclear energy, and energy conservation. An effort is currently under way to integrate information of an economic nature.

Representative Courses:
(1) Energy Conservation
(2) Geothermal Energy
(3) Non-Renewable Resources
(4) Renewable Resources
(5) Fundamentals of Combustion Engineering
(6) Energy Technology
(7) Solar Heating and Cooling System
(8) Nuclear Reactor Engineering
(9) Wind Energy

Research: Utility Rate Structures and Distributed Thermal Energy Storage

Related Activities: Energy-related continuing education activities are also conducted.

SOUTHEASTERN UNIVERSITY

Energy Management Concentration (Graduate)
Established November 1979

Contact:
Patricia Violante, Director, Graduate Admissions
Southeastern University
501 Eye Street, S.W.
Washington, D.C. 20024
(202) 488-8162

Type of Program: Formal graduate program that is a concentration in Business and Public Administration

Degrees/Diplomas/Certificates: M.B.P.A.

Description/Objectives: This program is designed to provide graduate education for professional careers in energy. Classes are held in highly concentrated sessions on Sundays only.

Representative Courses:
(1) Energy Production and Distribution
(2) Energy Consumption
(3) Contract Management
(4) Energy Needs Auditing
(5) Government Policies and Regulations

Enrollment: 21

Faculty: 4 PT

Student Assistance: Regular assistance

UNIVERSITY OF THE DISTRICT OF COLUMBIA

Energy Program Improvement
Established October 1980

Contact:
Tarak Nath Bhar
University of the District of Columbia
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008
(202) 272-2308

Type of Program: Informal program consisting of a single elective course within the Department of Electrical Engineering and Computer Science

Description/Objectives: The purpose of the Solar Energy Engineering course is to establish an energy-related instructional program at the university, to create energy awareness, and to meet the national demand for educating more personnel in the area of energy. Laboratory experiments are included in the course work.

Representative Course:
Solar Energy Engineering (Electrical Engineering and Computer Science)

Faculty: 2 FT

Annual Budget: $39,955

External Funding: National Science Foundation—$19,955

Related Activities: Cooperative Extension has a mobil unit that helps citizens make their homes more energy efficient.

BREVARD COMMUNITY COLLEGE

Solar Engineering Technology Program

Contact:
Norman Abell, Program Director
Brevard Community College
1519 Clear Lake Road
Cocoa, Florida 32922
(305) 269-5664

Type of Program: Formal degree program

Degrees/Diplomas/Certificates: A.S.

Description/Objectives: This program is designed to prepare students in the installation, design, sizing, research, and testing of solar systems.

Representative Courses:
(1) Energy Science I Lab
(2) Introduction to Solar Energy
(3) Collectors and Energy Storage
(4) Technical Survey of Energy Sources

Related Activities: Solar and energy conservation workshops offered through continuing education are also conducted.

EDISON COMMUNITY COLLEGE

Energy-Related Course
Established Fall 1979

Contact:
James L. Newton, Chairman, Basic Sciences Division
Edison Community College
College Parkway
Fort Meyers, Florida 33907
(813) 481-2121

Type of Program: Informal program consisting of one energy-related course

Description/Objectives: This course is designed to make students more aware of the present energy crisis and to inform them of ways to conserve energy. Topics are varied and include solar energy, geothermal energy, wind-powered generators, and electric vehicles. Intruction is presented in a multimedia fashion that includes lecture-demonstrations by the instructor and guests, use of films, filmstrips, video tapes, field trips, and product demonstrations.

Representative Course:
Alternate Energy Sources

Annual Budget: $2,613

External Funding: State funds

FLORIDA KEYS COMMUNITY COLLEGE

Energy-Related Courses
Established September 1979

Contact:
Beth B. Smith, Director, Community Instructional Services
Florida Keys Community College
#1 Junior College Road
Key West, Florida 33040
(305) 296-9081

Type of Program: Informal program consisting of noncredit, energy-related courses

Description/Objectives: These courses are designed to provide individuals with basic knowledge of wind, solar, and biomass power. Classroom instruction as well as hands-on experience is provided.

Representative Courses:
(1) How To Make Your Own Power
(2) Actual Construction of Alternate Energy Devices

Enrollment: 70

Annual Budget: $1,500

GULF COAST COMMUNITY COLLEGE

Energy and The Way We Live Program
Established February 1980

Contact:
Pam Hooper, Director, Community Servicies
Gulf Coast Community College
5230 West Highway 98
Panama City, Florida 32401
(904) 769-1551, x231

Type of Program: Formal program consisting of six community forums and a course by newspaper

Degrees/Diplomas/Certificates: Associate's level

Description/Objectives: The goal of these forums is to enhance the public understanding of energy issues. A one-credit-hour "Course by Newspaper" is also offered.

Annual Budget: $6,750

External Funding: Florida Endowment for the Humanities

Related Activities: Seminars such as Solar Cents Seminar, Your Energy Dollar: Make the Most of It, and Solar Energy Seminar are also conducted. A Consumer Symposium: Electricity, Gas, or Solar for the Home? and Home Energy Workshop, a library energy awareness program sponsored by the Northwest Regional Library System, are also offered.

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MIAMI-DADE COMMUNITY COLLEGE

Energy-Related Courses

Contact:
J. Terence Kelly, Vice President for Education
Miami-Dade Community College
11011 S.W. 104 Street
Miami, Florida 33176
(305) 596-1345

Type of Program: Informal program consisting of energy-related courses offered through continuing education

Description/Objectives: Continuing education courses offered include workshops for building a photovoltaic machine or a solar hot water heater and public forums on environmental issues.

UNIVERSITY OF MIAMI

Energy-Related Program (Graduate)

Established Fall 1974

Contact:
T. Nejat Veziroglu, Director
Clean Energy Research Institute
School of Engineering and Environmental Design
University of Miami
P.O. Box 248294
Coral Gables, Florida 33125
(305) 284-4666

Type of Program: Formal interdisciplinary graduate program offered by the Graduate School with the help of the Clean Energy Research Institute

Degrees/Diplomas/Certificates: M.S.; M.A.; D.A.; and Ph.D.

Description/Objectives: The goal of this program is to educate and train energy researchers in both hard sciences and social sciences in order for them to deal with the increasingly complex energy problems that keep arising. In addition to the two required courses, a thesis is necessary for successful completion of a degree program. The Ph.D. program requires that candidates complete a dissertation, while the D.A. program requirement is a research project. Subjects in both these cases must be energy-related.

Representative Courses: Required courses are:
(1) Energy Fundamentals
(2) Energy Studies Seminar

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UNIVERSITY OF SOUTH FLORIDA

Energy-Related Courses

Contact:
University of South Florida
4202 Fowler Avenue
Tampa, Florida 33620

Type of Program: Informal interdepartmental program consisting of energy-related courses

Description/Objectives: Energy-related courses involve the Physics and Geography Departments. The major goal of these courses is to help students learn about the energy crisis and to explore more efficient ways to use energy.

Representative Courses:
(1) Geography of Energy (Geography)
(2) Energy and Humanity (Physics)

Research: Research regarding energy use at the university itself is conducted.

Research Funding: Research foundations

COLUMBUS AREA VOCATIONAL-TECHNICAL SCHOOL

Solar-Related Program (projected)

Contact:
Jack Watkins, Coordinator
Columbus Area Vocational-Technical School
928 45th Street
Columbus, Georgia 31995
(404) 322-1425

Type of Program: Formal program which will be offered through the Department of Air Conditioning and Refrigeration.

Description/Objectives: The goal of this projected program is to acquaint students with the growing demand for energy production using solar heat.

GPO 77

GEORGIA INSTITUTE OF TECHNOLOGY

1. Undergraduate Energy Engineering Multidisciplinary Program
2. Graduate Energy Engineering Multidisciplinary Program

Established
1. *1975* 2. *Projected*

Contact:
W. Denney Freeston, Associate Dean
College of Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-3356

Type of Program:
1. Formal undergraduate program which is a specialization in energy within the degree program of Engineering
2. Formal graduate program which is a specialization within the degree program of Engineering

Degrees/Diplomas/Certificates:
1. B.S. degree in major field plus multidisciplinary certificate in Energy Engineering or Energy Studies
2. M.B.A. and Ph.D. levels

Description/Objectives:
1. This interdisciplinary program within the Department of Engineering includes a variety of courses from the Departments of Architecture, Chemical Engineering, Electrical Engineering, Mechanical Engineering and Nuclear Engineering. The Energy Engineering Program consists of a core curriculum made up of nine hours as follows: Socio-Technical Problems in Energy Engineering (Architecture); Impact of Energy Problems (Architecture); Energy Flow in a Systems Context (Architecture); and an in-depth curriculum made up of six hours of approved energy-related courses plus at least four hours of thermodynamics.
2. The proposed graduate program includes study in the areas of thermodynamics, heat transfer, fluid flow, control systems, and energy systems.

Representative Courses:
1. Undergraduate program:
(1) Power Plant Engineering (Mechanical Engineering)
(2) Solar Engineering (Mechanical Engineering)
2. Graduate program:
(1) Information Theory Thermodynamics

Enrollment: 28

Faculty: Approximately 50 PT

Student Assistance: Regular assistance

Related Activities: Energy-related extension courses and outreach programs are also conducted.

EASTERN ILLINOIS UNIVERSITY

Energy Management Program
Established 1976

Contact:
Hamid Gholamnezhad, Director
Energy Management Program
Eastern Illinois University
316A Coleman Hall
Charleston, Illinois 61928
(217) 581-6119

Type of Program: Formal interdisciplinary, degree granting program consisting of an energy management major within the Business program

Degrees/Diplomas/Certificates: B.S. (Business)

Description/Objectives: The Energy Management Program synthesizes the technological, business, economic, environmental, social and political aspects of energy. Students entering as freshmen spend their first two years learning some of the principles of energy management. In their third year, students learn about energy systems, such as energy generation, transmission and utilization. After completion of the third year, qualified students spend one semester in the "real world" acquiring energy-related experiences as interns in addition to following a highly individualized curriculum.

Representative Courses:
(1) Physics for Energy Management (Physics)
(2) Chemistry for Energy Management (Chemistry)
(3) Energy Policy I & II (Management)
(4) Energy Conservation (Management)
(5) National Policy Issues (Political Science)
(6) Energy Marketing (Marketing)
(7) Geology of Energy (Biology)
(8) Alternative Energy Systems (Industrial)
(9) Energy and Society (Sociology)
(10) Economics of Public Utilities (Economics)
(11) Energy and Environmental Law (Management)
(12) Energy Finance and Incentives (Management)
(13) Politics of Oil in the Persian Gulf States (Political Science)

Enrollment: 68

Faculty: 1 FT, plus faculty from course-related departments

Student Assistance: Internships

Annual Budget: $45,192

Related Activities: Energy-related community activities are also conducted.

EUREKA COLLEGE

Energy-Related Courses

Contact:
Rudy J. Eichenberger, Coordinator
Institutional Development
Eureka College
Eureka, Illinois 61530
(309) 467-3721

Type of Program: Informal program consisting of energy-related courses

Degrees/Diplomas/Certificates: Bachelor's level

Description/Objectives: These courses cover a variety of energy-related topics.

Representative Courses:
(1) Energy and Environment (Physical Science)
(2) Alternative Energies

GOVERNORS STATE UNIVERSITY

Energy-Related Courses

Contact:
Elizabeth Hagens, Professor of Anthropology
Governors State University
Park Forest South, Illinois 60466
(312) 543-5000, x2455

Type of Program: Informal program consisting of energy-related courses

Description/Objectives: These energy offerings are centered primarily in the program in Human-Environment Planning and cover a variety of energy-related topics.

Related Activities: A "Conference on Energy" has also been conducted.

ILLINOIS CENTRAL COLLEGE

Project AHEAD: Alternate Home Energy Application and Demonstration
Established Fall 1979

Contact:
Thomas Campbell, Vice President for Planning
Illinois Central College
East Peoria, Illinois 61635
(309) 694-5525

Type of Program: Informal program designed to supply enrichment to students in formal courses in the Natural and Applied Sciences and Liberal Arts, as well as to the general public

Description/Objectives: The construction of this model energy-efficient solar home has two functions: (1) as an educational laboratory and (2) as a community demonstration project. The purpose of this program is to provide students in engineering, science, and technology an active laboratory that illustrates the techniques for collection and distribution of solar energy, as well as educating the general public as to the need and feasibility of using free energy from nature. This is a continuing project, designed to be modified, altered, upgraded, and modernized as new developments in the use of alternative energy sources are found and tested.

Representative Courses:
Related required courses:
(1) Physical Science
(2) Physics
(3) Architecture
(4) Electronics

Faculty: 3 PT

External Funding: U.S. Department of Energy—approximately $50,000

ILLINOIS INSTITUTE OF TECHNOLOGY/INSTITUTE OF GAS TECHNOLOGY

1. Gas Engineering Option (Undergraduate)
2. Gas Engineering Programs (Graduate)

Contact:
Stuart Leipziger, Chairman, Department of Gas Engineering
Institute of Gas Technology
3424 South State Street
Chicago, Illinois 60616
(312) 567-3783

Type of Program:
1. Formal undergraduate program consisting of an option within the Department of Gas Engineering
2. Formal graduate degree programs within the Department of Gas Engineering

Degrees/Diplomas/Certificates: B.S., M.S., Master of Gas Technology, and Ph.D.

Description/Objectives: The Institute of Gas Technology, which was established 40 years ago by the U.S. gas industry as a not-for-profit education and research affiliate of the Illinois Institute of Technology, offers the following energy-related option and programs:
1. The Gas Engineering Option is designed to give background in current activities and requirements of the gas industry to students majoring in chemical, civil, fire protection and safety, and mechanical engineering who are planning careers in energy-related fields.
2. The Gas Engineering Department awards Master of Science, Master of Gas Technology, and Doctor of Philosophy degrees. The M.S. and Ph.D. programs are designed to provide students with strong technical backgrounds necessary for careers in engineering research and development in the energy field. The Master of Gas Technology program provides students with graduate training in the technologies of the energy industries. At the doctoral level, any aspect of gas engineering may be pursued in depth.

Representative Courses:
(1) Energy and Society (Graduate)
(2) Topics in Energy Supply (Graduate)
(3) Coal Gasification (Graduate and Undergraduate)
(4) Energy Conservation Principles (Graduate and Undergraduate)

Faculty: 5 FT

Student Assistance:
1. Half-tuition scholarships on undergraduate level
2. Institute of Gas Technology graduate fellowships and research assistantships, effective September 1981

Research: Coal gasification and liquifaction, gas solid transport, and fluidization are some of the areas of student research.

JOHN A. LOGAN COLLEGE

Solar Energy Training Program

Established January 1981 (Projected)

Contact:
Robert Irvin, Associate Dean
John A. Logan College
Carterville, Illinois 62918
(618) 985-3741

Type of Program: Informal program consisting of energy-related courses within the Construction Management Technology Department

Degrees/Diplomas/Certificates: A.A.S. level

Description/Objectives: This informal program involves energy-related courses designed to train construction workers in basic processes and fundamentals of solar energy.

LINCOLN LAND COMMUNITY COLLEGE

Energy-Related Workshops and Conferences

Contact:
Robert L. Poorman, President
Lincoln Land Community College
Shepherd Road
Springfield, Illinois 62708
(217) 786-2273

Type of Program: Informal program consisting of energy-related workshops and conferences

Description/Objectives: Conferences and workshops designed to explore energy issues include (1) nine three-day workshops for farmers and others involving the production of alcohol fuels; (2) an energy workshop for homeowners regarding insulation and related topics; (3) the Energy and The Way We Live forum, consisting of a three-session program; and (4) the National Alcohol Fuels conference for forty colleges preparing for workshops, with Lincoln Land Community College serving as host.

External Funding: U.S. Department of Energy

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McHENRY COUNTY COLLEGE

Energy Experience Program

Established 1979

Contact:
Deborah Lee Welch, Student Activities Coordinator
McHenry County College
Route 14 and Lucas Road
Crystal Lake, Illinois 60014
(815) 455-3700

Type of Program: Formal college and community program consisting of 10 days of energy programming

Description/Objectives: The goals of this program were to stimulate an interest in our current and future energy situation, to educate the college community and the public about our current energy situation, and to get the college community and the public to relate to the current and future energy situation how it affects their lives.

Annual Budget: $1,800

PRINCIPIA COLLEGE

Energy-Related Research

Contact:
David A. Cornell, Chairman
Department of Physics
Principia College
Elsah, Illinois 62028
(618) 374-2131

Type of Program: Formal interdepartmental program consisting of energy research options which involves the Departments of Physics and Earth Science

Description/Objectives: This research project is ongoing and is available for Physics and Earth Science majors. It entails the design of instruments and collection of data relating to energy alternatives (applicable to the Principia College environment). It employs the Solar-Environmental Data Acquisition and Processing System which was formalized in 1979. The system acquires data several times each hour on the following environmental parameters: solar flux in the horizontal and vertical planes, wind speed and direction, dry and wet bulb temperatures, barometric pressure, and solar collector input/output temperatures and water flow rates. This data should yield information on heating and cooling degree days, average intervals of cloudiness, average solar flux, wind speeds and weather patterns applicable to designing buildings employing alternative energy comfort controls as well as identify meaningful natural resources for the campus and surrounding community.

Enrollment: 3

Faculty: 2 part-time

Student Assistance: Teaching assistantship

Related Activities: Seminars in solar energy and earth tempered housing as well as energy overview lectures are also conducted.

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE

1. Coal Extraction and Utilization Research Center
2. Energy-Related Courses
Established May 1974

Contact:
Lyle V.A. Sendlein, Director
Coal Research Center
Southern Illinois University
Carbondale, Illinois 62901
(618) 536-5568

Type of Program:
1. Formal research and training program organized as an autonomous department
2. Informal interdisciplinary program consisting of energy-related courses

Degrees/Diplomas/Certificates: A.A. and Ph.D.

Description/Objectives:
1. The Center is designed to train personnel at both the advanced and technician levels for service in the coal extraction and utilization industry as well as to provide general knowledge in energy consciousness. Specialized activities are conducted in mining engineering, coal geology, land reclamation, fuel science and mining technology.
2. In addition, energy-related courses are offered by many departments and cover a variety of topics, including solar and electrical energy as well as energy and society.

Representative Courses:
(1) Solar Heating Systems (Thermal and Environmental Engineering)
(2) Electrical Energy Science (Electrical Science and Systems Engineering)
(3) Energy and Society (Sociology)
(4) Solar and Alternative Energy Planning (Geography)
(5) Energy Workshops (Education)
(6) Energy Regulation (Law)

Enrollment: Approximately 400

Student Assistance:
1. Domestic Mining Fellowships, U.S. Department of Education
2. Mineral Institute Fellowships, U.S. Department of the Interior

Research: Coal Research

Research Funding: University; state government; and federal government

Related Activities: Energy-related adult education, professional training, senior citizen and community activities are also conducted.

WESTERN ILLINOIS UNIVERSITY

Energy Education for Elementary Teachers

Established September 1980

Contact:
Donald K. Hamilton
Horrabin Hall 75A
Western Illinois University
Macomb, Illinois 61455
(309) 298-1624

Type of Program: Informal program consisting of two energy education courses taught at both the undergraduate and graduate levels

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives: The energy education courses are part of a sequence leading to a specialization in science education. The primary objective of the program is to familiarize prospective and in-service teachers with contemporary curriculum materials in energy education, with emphasis placed on materials prepared by the Department of Energy and the National Science Teachers Association.

Representative Courses:
(1) Energy Education for Elementary Teachers (Elementary Education)
(2) Environmental Education for Elementary Teachers (Elementary Education)

Enrollment: 300

Related Activities: Energy-related adult education and extension courses are also conducted.

INDIANA STATE UNIVERSITY

Thermography Project
Established February 1979

Contact:
Walter Carnahan, Associate Professor of Physics
Physics Department
Indiana State University
217 North 6th Street
Terre Haute, Indiana 47809
(812) 232-6311 x2366

Type of Program: Informal autonomous program involving the Physics Department

Description/Objectives: This program combines research and community education. A "fly-over" and computer mapping/analysis system is used to take thermograms of the city of Terre Haute to show thermal losses from buildings. Employees of the city, local television weatherpersons and others are then trained in the interpretation of thermograms and given information on heat loss and how to correct existing problems. The objective of this program is to inform Terre Haute residential and commercial building owners of heat loss problems and promising corrective measures.

Student Assistance: Graduate assistantships

Annual Budget: $170,000

External Funding: City of Terre Haute—$158,443

Research: Thermography

Research Funding: City of Terre Haute and University funds

Related Activities: Energy information sessions for the general public are also conducted.

INDIANA UNIVERSITY
Energy Policy Focus

Contact:
Charles F. Bonser, Dean
School of Public and Environmental Affairs
Indiana University
400 East Seventh Street
Bloomington, Indiana 47405
(812) 337-1432

Type of Program: Formal graduate degree program that is a focus in the Environmental Policy Concentration within the Master of Public Affairs Program

Degrees/Diplomas/Certificates: M.P.A.-E.P.; M.P.A./J.D.

Description/Objectives: The Master of Public Affairs-Environmental Policy Concentration (M.P.A.-E.P.) is a multidisciplinary study of the nature, origin, and options for solutions to environmental problems, with the emphasis on public policy. Students may specialize in the energy policy focus. A joint degree with Law (M.P.A./J.D.) is also available.

Representative Courses:
(1) Public Utilities Theory and Analysis (Business)
(2) Energy and Materials Residuals (School of Public and Environmental Affairs)
(3) Topics in Public Affairs (School of Public and Environmental Affairs)
(4) Energy Policy (School of Public and Environmental Affairs)
(5) Seminar in Public Transportation Policy (School of Public and Environmental Affairs)
(6) Political, Economic & Regulatory Aspects of Environmental Control (School of Public and Environmental Affairs)

Student Assistance: Graduate assistantships; associate instructorships; research assistantships; fellowships; and regular assistance

Research: Research by the Environmental Systems Application Center covers the areas of coal, energy and environmental education.

Research Funding: U.S. Environmental Protection Agency; U.S. Department of Education, Office of Environmental Education; and U.S. Department of the Interior

UNIVERSITY OF EVANSVILLE

Energy Management and Engineering Program

Established 1979-80

Contact:
William O. Hartsaw, Head
Mechanical Engineering Department
University of Evansville
P.O. Box 329
Evansville, Indiana
(812) 479-2654

Type of Program: Formal, autonomous program that is a specialization within the Mechanical Engineering Department

Degrees/Diplomas/Certificates: B.S. level; Certificate

Description/Objectives: The program is designed to serve the needs of engineering students. The goals of the program are to provide mechanical engineering graduates with a background in energy management and to train managers and building operators in energy conservation techniques. Assistance will be given in collecting the necessary data and to make recommendations regarding energy conservation measures. Workshops are conducted for managers and operating personnel on energy management and conservation.

Representative Courses:
(1) Energy Systems I and II (Mechanical Engineering)
(2) Environmental Control (Mechanical Engineering)
(3) HVAC Systems (Mechanical Engineering)
(4) Analysis/Redesign, HVAC Systems (Mechanical Engineering)

Enrollment: 15

Faculty: 4 FT, 1 PT

Student Assistance: Three student assistant positions

Annual Budget: $24,000

External Funding: U.S. Department of Energy—$9,000

Research: Solar and Thermal Energy

Research Funding: University

Related Activities: Energy-related adult education and professional training programs are also conducted.

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UNIVERSITY OF NOTRE DAME

Energy Sequence in Mechanical Engineering

Established January 1979

Contact:
John W. Lucey
Department of Aerospace and Mechanical Engineering
University of Notre Dame
Notre Dame, Indiana 46556
(219) 283-7381

Type of Program: Formal program that is a specialization within the Aerospace and Mechanical Engineering Department

Degrees/Diplomas/Certificates: B.S. and M.S. levels

Description/Objectives: This program was established to meet the demand for technically qualified professional engineers in all segments of the electric and power industry. The objective of this program is to provide a specific industrial focus to students with a mechanical engineering major.

Representative Courses:
(1) Introduction to Nuclear Engineering (Aerospace and Mechanical Engineering)
(2) Fundamentals of Combustion (Aerospace and Mechanical Engineering)
(3) Engineering Economy (Aerospace and Mechanical Engineering)
(4) Stress Analysis in Energy Sytems (Aerospace and Mechanical Engineering)
(5) Thermal Design of Energy Systems (Aerospace and Mechanical Engineering)

Enrollment: 20

Student Assistance: Assistance in securing summer employment in firms in the energy industry

External Funding: National Science Foundation Local Course Improvement Grant

Research: Nuclear Engineering and Solar Energy

Research Funding: National Science Foundation; Industry

Related Activities: Summer workshops in energy education for high school teachers are also conducted.

DES MOINES AREA COMMUNITY COLLEGE

Alcohol Fuel Production Course

Established Fall 1979

Contact:
Allen Suby
Des Moines Area Community College
2006 Ankeny Boulevard
Ankeny, Iowa 50021
(515) 964-6200

Type of Program: Informal program consisting of one energy-related course offered through the Adult and Continuing Education Division

Description/Objectives: This short-term course is designed to show students how to set up and operate on-farm stills for producing ethanol from cereal grains.

Representative Course: Alcohol Fuel Production

Faculty: 10 PT

Annual Budget: $10,000

External Funding: U.S. Department of Energy

Research (Projected): Solar-assisted ethanol production; modification of the diesel engine to operate on ethanol.

Research Funding: U.S. Department of Energy

Related Activities: Energy-related consumer education and community activities are also conducted.

IOWA STATE UNIVERSITY

Energy-Related Course

Established March 1979

Contact:
Laurent Hodges, Professor of Physics
Iowa State University
Ames, Iowa 50011
(515) 294-1185

Type of Program: Informal program consisting of one energy-related course cross-listed in Architecture and Physics

Description/Objectives: In this course students are paired into teams and design solar homes of various specifications, carrying out the necessary heat loss and solar radiation calculations.

Representative Course: Solar Home Architecture (Architecture and Physics)

Related Activities: A seminar, "Energy Awareness Week," was conducted to provide students with further knowledge on energy topics.

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KIRKWOOD COMMUNITY COLLEGE

Energy-Related Course

Established August 1979

Contact:
David Bunting, Director
Non-Traditional Studies
Kirkwood Community College
P.O. Box 2068
Cedar Rapids, Iowa 52406
(319) 398-5512

Type of Program: Informal program consisting of one energy-related course

Description/Objectives: This course is delivered by a teaching system called TELE-NETWORK and is designed to provide the students with information in order to deal with the concepts, problems, and alternatives of the energy picture.

Representative Course: Energy Today

Annual Budget: $2,300

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WESTMAR COLLEGE

Alternate Energy Institute
Established Fall 1980

Contact:
Robert Franklin, Professor
Westmar College
Lemars, Iowa 51031
(712) 546-6876

Type of Program: Formal interdisciplinary program consisting of energy-related special classes and seminars and organized as an Institute

Description/Objectives: The Institute is designed to encourage widespread use of conservation, as well as to provide detailed information on alternate energy sources such as passive solar buildings, earth sheltering, etc. An important objective is that the consciousness of local homeowners be raised in regard to life-cycle costs of various building techniques and related matters.

Representative Course: Alternate Energy (Chemistry and Physics)

Faculty: 3 PT

Student Assistance: Wind Project assistance

External Funding: World Hunger Committee, Division of Higher Education, United Methodist Church—$18,000

Research: Wind driven refrigeration and heat pump project

Research Funding: United Methodist Church

Related Activities: Energy-related adult education, professional training and consumer education programs are projected. Some will be in cooperation with the City Administration.

COLBY COMMUNITY COLLEGE

Alcohol Fuel Production Workshops
Established July 1979

Contact:
James H. Tangeman, President
Colby Community College
1255 South Range
Colby, Kansas 67701
(913) 462-3984

Type of Program: Informal program consisting of energy-related workshops

Degrees/Diplomas/Certificates: Certificate

Description/Objectives: The goals of these workshops are to familiarize persons with the concept of using alcohol for fuel, to assist them in examining the pros and cons of its production, to explain the complexity of producing alcohol, and to allow them to actually produce their own alcohol in a laboratory.

FORT HAYS STATE UNIVERSITY

Energy-Related Courses
Established September 1978

Contact:
Maurice H. Witten
Physics Department
Fort Hays State University
Hays, Kansas 67601
(913) 628-5844

Type of Program: Informal program consisting of energy-related courses within the Department of Physics

Degrees/Diplomas/Certificates: B.A. and B.S. levels

Description/Objectives: These energy-related courses given within the Department of Physics hold particular relevance for teachers who wish to qualify for anticipated state mandated energy education programs. The program places special emphasis on energy-efficient homes.

Representative Courses:
(1) Energy Efficient Homes (Physics)
(2) Energy Education (Physics)

Enrollment: 50

Faculty: 4 FT, 1 PT

Available Student Assistance: Hourly employment of undergraduate students

Related Activities: Energy-related adult education and extension courses as well as outreach programs and community activities are also conducted.

UNIVERSITY FOR MAN AT KANSAS STATE

Energy-Related Workshop

Established September 1977

Contact:
Gary Coates, Director
Appropriate Technology Program
University for Man at Kansas State
1221 Thurston Avenue
Manhattan, Kansas 66502
(913) 532-5866

Type of Program: Informal program consisting of a community oriented, energy-related workshop

Description/Objectives: An energy-saving window workshop is conducted for area residents each trimester. In addition, how-to-do-it brochures describing procedures for the construction and installation of window treatments are available.

WICHITA STATE UNIVERSITY

Energy-Related Courses

Contact:
J. Robert Berg, Chairman
Department of Geology/Geography
Box #27
Wichita State University
Wichita, Kansas 67208
(316) 689-3141

Type of Program: Informal program consisting of energy-related courses in the Department of Geology/Geography

Degrees/Diplomas/Certificates: B.A. and B.S. levels

Description/Objectives: This program's courses examine the significance, availability and location of energy and mineral resources related to the protection and improvement of the environment. Courses are aimed to prepare professionals for work in energy industries, as well as to inform and educate students in environmental resource depletion and allocation.

Representative Courses:
(1) Petroleum and Geology
(2) Energy Resources and Environment
(3) Energy Alternatives and Environmental Impacts
(4) Explorations in Geophysics

Enrollment: 150

Faculty: 7 FT, 6 PT

Student Assistance: Six graduate teaching assistantships; two research assistantships; five scholarships; and part-time positions with oil companies

Annual Budget: $125,000

External Funding: State of Kansas

Research: National Uranium Resources Evaluation

Research Funding: U.S. Department of Energy—$700,000

Related Activities: Energy-related adult education, extension and professional training courses, consumer education, and outreach programs are also conducted.

KENTUCKY STATE UNIVERSITY

Energy Management Assistance Program

Contact:
Karen Carey, Coordinator
Institutional Studies
Kentucky State University
Box 42
Frankfort, Kentucky 40601
(502) 564-5763

Type of Program: Formal program consisting of seminars, workshops, and a variety of services

Description/Objectives: The purpose of this program is to provide assistance to small industrial and commercial businesses in the Kentucky State University area in identifying and implementing energy management and cost-reduction measures. The program conducts on-site inspections and evaluations, workshops, and seminars on energy-related matters, and provides do-it-yourself energy-audit workbooks.

External Funding: Sponsored by the Kentucky Department of Energy

LEES JUNIOR COLLEGE

Mining and Reclamation Technology Program
Established August 1975

Contact:
Pierre N. Allaire, Director
Mining and Reclamation Technology Program
Lees Junior College
Jackson, Kentucky 41339
(606) 666-4101

Type of Program: Formal degree program in Surface Mining

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This program specializes in Surface Mining with a heavy emphasis on reclamation. The objectives of this program are (1) to train technicians for employment in coal mining, related industries and pertinent governmental agencies; (2) to articulate the program with area secondary schools, to publicize the profession and to identify prospective students; (3) to provide technical part-time education for personnel currently employed in mining and reclamation; and (4) to assist program graduates in locating appropriate positions of employment.

Representative Courses:
(1) Principles of Leadership (Business)
(2) Technical Drawing (Civil Engineering)
(3) Land Reclamation (Mining Technology)

Enrollment: 30

Faculty: 2 FT, 5 PT

Student Assistance: Summer co-op program in which students work with coal companies or the State Reclamation Department

Annual Budget: $40,000

External Funding: Kentucky Department of Energy, Institute for Mining and Minerals Resources—$40,000

Research: Research on the effects of mining and reclamation on wildlife, with the objective to suggest some viable uses for reclaimed surface coal mines, with wildlife as the primary land use.

Research Funding: Kentucky Department of Energy, Institute for Mining and Minerals Resources

Related Activities: A slide program on the mining industry which describes the entire mining occupation and attendant occupations has been developed. This presentation is often requested by high school guidance counselors. Energy-related continuing education is also conducted.

MOREHEAD STATE UNIVERSITY

Energy Education Program
Established 1977

Contact:
Jerry F. Howell, Jr., Director
Center for Environmental Studies
Morehead State University
University Boulevard
Morehead, Kentucky 40351
(606) 783-3328

Type of Program: Formal program consisting of energy-related workshops, seminars, research, and in-service teacher training

Description/Objectives: The Energy Education Program consists of the following activities: energy-related seminars for regional builders and homeowners; public energy awareness seminars; an energy-related workshop for students; and teacher education workshops in energy.

External Funding: U.S. Department of Energy; U.S. Bureau of Mines; Kentucky Department of Energy; and Kentucky Department of Education

Research: Research is conducted in energy production.

NORTHERN KENTUCKY UNIVERSITY

Energy Management Assistance Program

Contact:
Mike McPherson, Associate Professor of Physics
Northern Kentucky University
Highland Heights, Kentucky 41076
(606) 292-5409

Type of Program: Formal energy-related outreach program offered through the University Extension Service

Description/Objectives: This outreach program, offered by the extension service, is part of the Kentucky Department of Energy Conservation Plan. It is designed to provide advice and assistance to small businesses in eight Northern Kentucky counties in identifying energy conservation/energy cost reduction options and the implementation of those options.

Related Activities: Adult education energy seminars are presented every fall as part of the Kentucky Energy Consortium.

McNEESE STATE UNIVERSITY

Energy Research

Established May 1979

Contact:
O.C. Karkalits, Dean
School of Engineering & Technology
McNeese State University
Lake Charles, Louisiana 70609
(318) 478-8070

Type of Program: Research program

Description/Objectives: The standardization of sampling and analysis of geopressured fluids research program is designed to study regional well-sites and test geopressured fluids.

Annual Budget: $220,000

Research: Geothermal Energy

Research Funding: U.S. Department of Energy; Gas Research Institute, Chicago

COLLEGE OF THE ATLANTIC

Environmental Design Program

Established 1977

Contact:
Roc Caivano, Director
Environmental Design
College of the Atlantic
Bar Harbor, Maine 04609
(207) 288-5015

Type of Program: Formal interdisciplinary program concentrating on the man-made environment

Description/Objectives: This program incorporates math, physics, art, architecture, environmental sciences, sociology, economics, law, and a sequence in solar design and alternative energy research. The Environmental Design curriculum concentrates on the man-made environment. This program has three levels of study: the remedial level of study covers basic skills such as carpentry, plumbing, electrical work, ironwork, and manual competency; the intermediate level of study involves learning marketable skills such as cabinetmaking, drafting, surveying, landscape, basic economics, and small business practices; the specialized area of study concentrates on architectural design, site analysis, environmental impact surveys, both structural and mechanical engineering, and alternate and appropriate technology.

External Funding: Fund for the Improvement of Post-Secondary Education, U.S. Department of Education

ANNE ARUNDEL COMMUNITY COLLEGE

Appropriate Technology Program
Established 1978

Contact:
Theodore W. Suman, Associate Professor, Biology
Anne Arundel Community College
101 College Parkway
Arnold, Maryland 21012
(301) 269-7269

Type of Program: Informal program consisting of a series of noncredit courses offered through the Office of Community and Extension Services and Evening Administration

Description/Objectives: These non-credit course offerings were established to help students explore the various ways of reducing energy consumption. They are designed to provide alternative solutions and to explore existing practical information.

Representative Courses:
(1) Self-Sufficiency: Food and Health (Community Services)
(2) Self-Sufficiency: Energy Production (Community Services)

Related Activities: The College sponsored a three-part energy forum for the community in which guest speakers were brought in to discuss different aspects of the energy situation.

UNITED STATES NAVAL ACADEMY

1. Energy Awareness Television Tape
Established December 1978

Contact:
Arthur E. Bock, Professor, Naval Systems Engineering Department
U.S. Naval Academy
Annapolis, Maryland 21402
(301) 267-3791

Type of Program: Informal program consisting of a variety of energy-related activities.

Description/Objectives: This tape is designed for use as part of the Naval Engineering I course as well as for other midshipmen's organizations, faculty, and interested groups. The thirty-five-minute tape outlines the problem the Navy and the country face both at home and on a world-wide basis. Both sources and quantities of fossil fuels known and predicted to be available are set forth; the national versus the international supply of oil, coal, and gas is portrayed; and the potential for tar sands and shale to be sources of oil is developed. Thus, the tape attempts to enlighten people as to the gravity of the fuel situation and to encourage conservation and other means of energy use reduction.

External Funding: Navy Energy Office

UNITED STATES NAVAL ACADEMY – continued

2. Energy Awareness Program

Established July 1977

Contact:

Arthur E. Bock, Professor, Naval Systems Engineering Department
(301) 267-3791

Description/Objectives: The Energy Awareness Program was designed to increase the awareness of faculty, students, and staff of the energy program. The following are some of the activities comprising the program:

(1) The development of energy displays for use in the lobby of the main library. The theme of 1978 was Energy and the Navy Sail to Nuclear Power. The following year's theme was Conservation of Energy—A Simple Matter of Patriotism.

(2) The preparation and dissemination of two brochures, respectively entitled *What About the Energy Crisis?* and *Energy and the Navy.*

(3) The development of Energy Awareness Week, during which feature articles prepared by the Public Affairs office appeared in the local newspapers. Educational television productions of particular activities were broadcast.

(4) The initiation and distribution of an *Energy Newsletter* providing bibliographic information on the most recent energy publications and newsletters received.

(5) The Energy Laboratory Concept continues to be developed in support of measurement and demonstration experiments including heat conduction and heat exchange experiments, fuel cells, solar collectors, solar tracking, wind power generator, and Sterling engine demonstrations.

(6) The annual Naval Academy Foreign Affairs Conference '79 developed the theme of "The Role of U.S. in the Middle East," with a workshop devoted to energy policy.

External Funding: Navy Energy and Natural Resources Research and Development Offices

UNITED STATES NAVAL ACADEMY – continued

3. Energy Minute Program
Established June 1978

Contact:
Robert Artigiani, Assistant Professor, History Department
(301) 267-3765

Description/Objectives: The Energy Minute Program was researched, written, and produced by a faculty committee. This program's tapes are based on the minute format which appeared on commercial television for the Bicentennial and are designed to bring energy awareness into the classroom on a daily basis in a way that would support the curriculum while not overwhelming it. A total of twelve one-minute programs were produced, stored on videotape and played on the collegewide T.V. station periodically into every classroom. Minutes, geared to sensitize students to energy problems, were viewed in American Naval History class and periodically shown on the Video Internal Information Program throughout the academic year. Energy Minutes include: Energy in the Age of Sail; The Impact of Steam; Problems of Reliance on Coal; Coaling Stations and U.S. Diplomacy; The Search for Fuel Efficiency; Anglo-American Competition for Middle East Oil; Oil and Strategy in World War II; Middle East Oil and Cold War Diplomacy; Strategic Impact of Nuclear Power; and German Synthetic Fuel in World War II.

UNITED STATES NAVAL ACADEMY—continued

4. Energy Conversion Course
Established 1977

Contact:
Chih Wu, Professor, Mechanical Engineering Department
(301) 267-3186

Description/Objectives: As part of the Energy Conversion course, students research an energy project.

UNITED STATES NAVAL ACADEMY—continued

5. Ocean Energy Conversion Course

Established 1978

Contact:
Michael E. McCormick, Professor, Ocean Engineering Department

Description/Objectives: The Ocean Energy Conversion course deals with alternate energy sources of the oceans. These alternate sources—ocean thermal gradients, waves, tides, ocean currents and salinity—are treated in terms of their potential, conversion into useful energy forms, and the various environmental effects on marketability.

UNITED STATES NAVAL ACADEMY – continued

6. Faculty-Student Seminar-Lecture Series on Energy Conservation and Energy Awareness

Established September 1978

Contact:
Rocco M. Paone, Professor, Political Science Department
(301) 267-3476

Description/Objectives: The primary focus of this seminar-lecture series was energy conservation and awareness. Specialists led seminars and gave evening lectures. The series of eight seminars was aimed primarily at faculty, with lectures geared to both faculty and students. These specialists conducted seminars in energy conservation, energy budgets, nuclear power, synthetic fuels, and international relations in the afternoon followed by lectures in the evening. The lecture series has been compiled, edited, and published in a booklet that has been used in some courses.

External Funding: Navy Energy Office

UNITED STATES NAVAL ACADEMY – continued

7. Energy Interdisciplinary Course

Proposed

Contact:

Robert Artigiani, Assistant Professor, History Department
(301) 267-3765

Description/Objectives: The energy interdisciplinary course has two primary aims: to communicate information related to the technical, social, economic, and political aspects of the energy crisis; and to serve as a vehicle for the development of future interdisciplinary studies and course offerings. This two-unit credit course draws upon the Departments of Physics, Geology, Chemistry, Nuclear Engineering, Design Engineering, Political Science, History, and Economics.

UNITED STATES NAVAL ACADEMY—continued

8. Teaching Energy Awareness by Computer

Established 1977

Contact:
Chih Wu, Professor, Mechanical Engineering Department
(301) 267-3186

Type of Program: One part of an informal overall program consisting of a variety of energy-related activities.

Description/Objectives: This computer simulation energy awareness program has given students a better understanding of the energy crisis. Students use the graphic system BASIC Language on the Tektronix facility.

UNIVERSITY OF MARYLAND, BALTIMORE COUNTY

1. Energy Revolution: The Shape of Our Future
2. Energy-Related Courses
Established
1. *September 1979*

Contact:
Charlene B. Dale
Coordinator of Special Events and Alumni Affairs
University of Maryland, Baltimore County
University Relations
5401 Wilkens Avenue
Catonsville, Maryland 21228
(301) 455-2901

Type of Program:
1. Formal program organized as a lecture-forum series and cosponsored by the newspaper *The Evening Sun*
2. Informal program consisting of energy-related courses

Description/Objectives:
1. This series was free to the public and conducted on four consecutive Thursday evenings. The forum dealt with various aspects concerning energy and presented panel members and speakers with in-depth technical knowledge in energy. The program incorporated an interdisciplinary approach to the topic of energy, addressing sociological, economic, scientific, and governmental aspects of diverse energy topics.
2. This program offers a number of courses dealing with a variety of energy-related issues.

UNIVERSITY OF MARYLAND, COLLEGE PARK

1. World Order Studies Program
2. Energy-Related Courses

Established
1. *1978 (official approval for certification pending)*
2. *1980*

Contact:
1. Dennis Pirages, Associate Professor of Government and Politics
2. Kurt Finsterbush, Professor of Sociology
University of Maryland, College Park
College Park, Maryland 20741
1. (301) 454-3322
2. (301) 454-5571

Type of Program:
1. Formal interdisciplinary program with a futuristic orientation
2. Informal program consisting of one energy-related course

Description/Objectives:
1. This program has four areas of study from which students can choose a major: the environment; global political economy; human rights and social justice; and world food problems. The program covers a variety of critical problems facing society, including energy and resources. Energy problems are placed within the larger context of global political, sociological, environmental and economic considerations. Direct field experience exists for students, which has included traveling and studying abroad.
2. This course deals with the energy situation, its scarcity in particular, from a sociological point of view.

Representative Course:
2. Scarcity and Society: Ecosystems and Social Change (Sociology)

External Funding:
1. U.S. Office of Education and the Institute for World Order

BRISTOL COMMUNITY COLLEGE

Energy Systems Technology Program
Established 1978

Contact:
Malcolm E. Berrett, Assistant Professor
Engineering Technology
Bristol Community College
777 Elsbree Street
Fall River, Massachusetts 02720
(617) 678-2811

Type of Program: Formal interdepartmental program

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: Energy Systems Technology encompasses the general field of energy and its use. It involves the means for determining energy requirements and the procedures for evaluating appropriate energy sources to satisfy the requirements. New and existing alternate energy sources are studied and their application to current systems is determined. The major focus is on solar energy, but wind and hydro-sources are considered. This program trains technologists for working in the heating, ventilating and air conditioning field. After the first two years students may transfer into a standard engineering program in a 4-year institution.

Representative Courses: Required courses in Engineering are:
(1) Introduction to Primary Energy Sources
(2) Heat as a Medium
(3) Design and Manufacturing Lab
(4) Heating, Cooling and Electrical Systems
(5) Two lecture and laboratory courses on the engineering fundamentals on solar and associated energy systems

Enrollment: 13

Faculty: 1 FT

Annual Budget: $31,500

External Funding: Vocational Education, Commonwealth of Massachusetts—$31,500

Related Activities: Energy-related adult education courses are also conducted.

CLARK UNIVERSITY

1. The Energy Phone
2. Energy-Related Course
Established **1.** *September 1977*

Contact:
Dennis W. Ducsik, Assistant Professor and Associate Chairman
Program on Science, Technology, and Society
Clark University
950 Main Street
Worcester, Massachusetts 01610
(617) 793-7111

Type of Program:
1. Informal program consisting of an information and referral service, a joint project of the Science, Technology, and Society Program and the Center for Technology, Environment, and Development
2. Informal program consisting of one energy-related course

Description/Objectives:
1. This service was designed to provide Massachusetts residents with useful information on energy conservation and energy efficiency through renewable resources. Roughly twenty students from Clark University as well as Worcester Polytechnic Institute man the Energy Phone, handling questions and frequently mailing information packets. Operators are required to have a thorough knowledge of conservation and must be able to communicate effectively with the public. They are given a manual consisting of over 200 pages of fact sheets covering four major areas of interest to homeowners. These areas—insulation, heating systems, weatherization, and appliances—will probably be expanded to include sections on wood-burning and solar applications. The manual was developed at Clark University with the help of students working on a special project basis. Research is often necessary to provide a caller with complete, correct, and up-to-date information; therefore, the Energy Phone maintains on the premises an extensive library containing reference books, technical reports, periodicals, and other materials.
2. The major foci of this course are the logic and economics of conservation, theory of heat loss, conventional heating technology, wood burning, and passive solar applications. This course provides the conceptual foundation for operators in addition to the on-the-job training. The Practicum is an intensive course including a full semester of lectures, problem sets, special seminars, guest speakers, and a field demonstration of an energy audit.

Representative Course:
2. Practicum in Home Energy Conservation

Enrollment: 1. 20

External Funding:
1. Massachusetts Executive Office of Energy Resources and U.S. Department of Energy

HARVARD UNIVERSITY

Energy Research Project
Established 1972

Contact:
Robert Stobaugh, Professor of Business Administration
Harvard Business School
Harvard University
Boston, Massachusetts 02163
(617) 495-6296

Type of Program: Formal program consisting of energy research

Description/Objectives: The Energy Project, designed to study the energy problem, published its findings in the book, *Energy Future*, to educate people about the energy problems America faces, and to aid academicians, business executives, energy policy makers, and concerned citizens in understanding complicated energy issues. The book is currently widely used as an educational reference and guide.

Research Funding: Division of Research at the Harvard Business School

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Energy-Related Programs, Courses and Research

Contact:
Kent F. Hansen, Associate Dean of Engineering
Massachusetts Institute of Technology
Room 1-206
Cambridge, Massachusetts 02139
(617) 253-3293

Type of Program: Formal interdisciplinary programs consisting of energy-related courses, specialization and research

Degrees/Diplomas/Certificates: B.A.; B.S.; M.S.; M.B.A.; Ph.D.; D.Sc.; and Engineering degrees

Description/Objectives: M.I.T. has a broad and diverse range of energy-related programs which include various schools, departments, and research centers and laboratories in Architecture and Planning, Engineering, the Social Sciences and Humanities, Management, and the Natural Sciences. All programs are flexible in order to accomodate growth and change in the respective fields and in student needs. Energy advisors have been appointed in each department, laboratory and center to provide students with information on degree programs, elective subjects and research opportunities. All energy-related program descriptions are listed on the following pages according to the School/Department or Research Center/Laboratory to which they belong.

Representative Courses: See individual program descriptions

Faculty: 950 FT

Student Assistance: A wide variety of financial support

Research: See individual program descriptions

Related Activities: See individual program descriptions

MASSACHUSETTS INSTITUTE OF TECHNOLOGY – continued

1. School of Architecture and Planning

I. Department of Architecture

Description/Objectives: The department offers an energy-related program in the Building System Design area which focuses on energy systems in buildings, their thermal performance, microclimates and their utilization in structures, energy implications of design and uses of solar energy.

Representative Courses:
(1) Natural Daylighting Seminar
(2) Use of Energy in Buildings
(3) Solar Archi'ecture
(4) Energy Conscious Design Studio

Research: The M.I.T. Solar House, new materials; and more energy-efficient buildings

II. Department of Urban Studies and Planning

Description/Objectives: The department offers a variety of courses and programs that relate to cities: their planning, environment, applicable technologies and institutional problems.

Representative Courses:
(1) Introduction to Public Policy Analysis & Governmental Action
(2) Technology and the City
(3) Introduction to Environmental Issues
(4) Environmental Policy and Regulation
(5) Environmental Quality and Assessment

MASSACHUSETTS INSTITUTE OF TECHNOLOGY—continued

2. School of Engineering

I. Department of Civil Engineering

Description/Objectives: The department has particularly strong energy-relevant activities in three major areas:

A. Constructed Facilities Division, which deals with the design, analysis and construction of energy facilities and which emphasizes establishing skills relevant to engineering aspects of large power plants (nuclear, fossil, etc.), underground transportation systems, synthetic fuel plants, off-shore installations, etc.

B. Water Resources and Environmental Engineering Division, which deals with the water supply and consumptive use in large energy systems, and energy generation technology from many kinds of water systems.

C. Transportation Systems Division, a joint activity with the Center for Transportation Studies, which highlights the transporting of people and general goods, with special emphasis placed on the transportation of fuels. Studies include environmental, economic, and social factors other than technology.

Representative Courses:
(1) Transportation and the Environment
(2) Urban Transportation Planning
(3) Structural Mechanics in Nuclear Power Technology

Research: Approximately thirty research projects, largely within the three categories described above.

II. Department of Mechanical Engineering

Description/Objectives: The department deals largely with energy conversion and utilization, with the undergraduate program providing interested students with preparation for energy-related careers.

Representative Courses:
(1) Thermal Power Systems
(2) Energy Production from Renewable Resources
(3) Fundamentals of Mining Technology

Research: Geothermal energy; separation of hexane from polybutadiene; development of innovative, energy-conserving processes in currently energy-intensive areas, particularly industrial ones.

III. Department of Materials Science and Engineering

Description/Objectives: The department deals with the properties of the component materials of various energy technologies and both extreme and not so extreme materials.

Representative Course: Materials for Advanced Energy Systems

Research: Research spans the entire temperature range from superconductor to high temperature ceramics preparation and properties of new solar cell materials, stress corrosion, and power metallurgy.

IV. Department of Electrical Engineering and Computer Science

Description/Objectives: M.I.T.'s largest department, it is involved in power systems, computer sciences, communications systems, information processing, applied plasma science, etc.

Representative Courses:
(1) Solar Energy Systems
(2) Electric Power Systems I & II
(3) Planning and Operation of Power Systems

Research: Staff and students' participation in M.I.T.'s Plasma Fusion Center; novel solar photovoltaic systems; electric systems with inter-active utility-customer control; a large superconducting alternator; and simulating power electronic systems.

V. Department of Chemical Engineering

Description/Objectives: The department prepares students for energy-related careers in diverse fields such as petroleum production and processing, fuel from coal and many other materials, as well as understanding the combustion process.

Representative Courses:
(1) Mass and Energy Processing
(2) Air Pollution Fundamentals
(3) Experimental Methods in Combustion and Heat Transfer
(4) Energy Technology

Research:
A. Chemical processing of fuels including improved methods of extracting oil and gas from the ground; the manufacture of synthetic fuels from coal, oil shale and biomass; the refining of fuels and removal of pollutants. Specific research projects are underway in coal liquefaction, new catalytic processes and simulation of fossil energy conversion systems.

B. Combustion research—what happens to the constituent sulfur and nitrogen in a coal particle as it burns and in what kind of an environment, including coal gasification; new catalytic processes; pyrolysis; fluidized bed combustion; modeling of flow structures to understand performance of and emissions from combustors. Much of this research is carried out in collaboration with the Energy Laboratory.

continued

VI. Department of Ocean Engineering

Description/Objectives: The department deals with what we do on and near oceans and how it relates to energy.

Representative Courses:
(1) Ship Power & Propulsion
(2) Thermal Power Systems

Research: Coal-burning ships; energy conversion from waves; advanced ship propeller design; and ocean thermal energy conversion from waves.

VII. Department of Aeronautics and Astronautics

Description/Objectives: The department deals with what we do in the air or in space and how it relates to energy.

Representative Courses:
(1) Aerodynamics, Structural Dynamics and Aeroelasticity of Wind Turbines and Rotorcraft
(2) Invention Development Laboratory

Research: Air and space vehicles and their energy intensivity; the aeromechanical properties of wind turbines as rotors, shrouds, winglets, etc.

VIII. Department of Nuclear Engineering

Description/Objectives: The undergraduate program provides a broad background in the basic and applied sciences relevant to energy technology, plus (in applicable cases) a grounding in fission or fusion science and technology. Mainly a graduate department, it offers courses in reactor physics and engineering, fusion science and technology, materials and fuel cycle studies.

Representative Courses:
(1) Energy
(2) Energy Assessment
(3) Reliability Analysis (of Nuclear Reactors and Other Large Systems)

Research: Research program coupled with work in other departments and research centers and the Energy Laboratory includes areas such as fluid flow and heat transfer; fusion materials studies; reactor-related studies; fusion technology, radiation damage in fission and fusion systems; energy policy studies (jointly with some of the U.S. National Laboratories); nuclear proliferation and international security; total energy systems; analysis of effectiveness of the end-use of energy; atmospheric buoyant plume modeling; safety research; and the physics of plasma turbulence.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY—continued

3. School of Humanities

I. Department of Economics

Description/Objectives: The department offers courses in energy economics.

Representative Courses:
(1) Economics of Project Evaluation
(2) Energy Economics
(3) The Energy Industries

Research: Carried out through the Energy Laboratory, research includes electric power systems for Egypt; the impact of quality regulation upon the automobile industry; and time-of-day energy demand.

II. Department of Political Science

Description/Objectives: The department's main emphasis is on the graduate program with many of the courses and programs being joint with other energy-related activities at M.I.T. For example, students working on energy technology in the School of Engineering, but whose concerns involve government and policy analysis, will take courses here.

Representative Courses:
(1) Seminar in Systematic Policy Analysis and Technology Assessment
(2) Science, Technology and the State
(3) Science and Technology in International Affairs

Research: Most energy-related research projects of this department are described under activities of the Center for International Studies or the Energy Laboratory (see below). Within the department research includes studies of congressional voting patterns on energy issues and the relationship between nuclear power policy and nuclear weapons proliferation policy.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY – continued

4. School of Management

1. Department of Management

Description/Objectives: The department's energy-related activities proceed both within the school and in collaboration with other units, principally the Energy Laboratory, the Economics Department and the Political Science Department.

Representative Courses:
(1) Public Sector Economics and Finance
(2) Energy Economics and Policy

Research: World oil markets and the financial problems created by changes in oil price and volume; uranium supply and international nuclear fuel strategies; and econometric model-building to represent the influence of oil market decisions on national and international behavior.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY—continued

5. School of Science

I. Department of Chemistry

Description/Objectives: The department deals with classical chemistry which relates to energy in various ways, but particularly relevant areas are chemical thermodynamics and physical chemistry.

Representative Courses:
(1) Chemical Thermodynamics
(2) Physical Chemistry

Research: Joint research with other departments on the health effects of fuel soot and polycyclic aromatic hydrocarbons generated during combustion.

II. Department of Earth & Planetary Sciences

Description/Objectives: The department's courses relate directly to exploration for petroleum, uranium and other natural resources, and to other plutonic matters, such as geothermal energy.

Representative Course: Petroleum Geology

Research: Hydrofacturing of hot dry rock; magma transport; and migration of uranium and thorium through microcracks in igneous rocks.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY—continued

6. Special Research Centers and Laboratories

I. Center for Advanced Engineering Systems

Description/Objectives: A program in thermoeconomics combines thermodynamics and economic modes of analysis to pinpoint why reliable and efficient energy-using systems cost what they do. The methods used are based on available energy analysis combined with a unique pricing scheme.

II. Center for International Studies

Description/Objectives: The Center does much of its energy-related research with the Energy Laboratory, as well as with other M.I.T. units. Examples of research include international environmental issues and studies in nuclear power systems.

III. The Energy Laboratory

Description/Objectives: About 200 undergraduate and graduate students are currently involved. Laboratory topics are: (1) Energy System Modeling and Analysis Methodologies, (2) Energy Model Analysis, (3) International Energy Studies, and (4) Energy Conversion.

IV. Frances Bitter National Magnet Laboratory

Description/Objectives: The Laboratory works closely with the Plasma Fusion Center and other groups on fusion-related topics, as well as other energy-related activities.

V. Harvard-M.I.T. Division of Health Sciences and Technology

Description/Objectives: Studies of the potential health effects of combustion products of fossil fuels are conducted.

VI. Innovation Center

Description/Objectives: This division of the School of Engineering provides students with the opportunity for graduate thesis and project work. The center is preparing an Energy Technology Handbook (for the U.S. Department of Energy), with a focus on innovative opportunities. Another book is being prepared which describes methods of evaluating energy-related inventions.

VII. Laboratory of Architecture and Planning

Description/Objectives: Research topics include energy-conscious planning and design; building insulation; and residential energy conservation.

continued

VIII. Laboratory for Computer Science

Description/Objectives: Energy-related studies such as how to work best with large amounts of data on energy use by various sectors at different times and places are conducted.

IX. Laboratory for Manufacturing and Productivity

Description/Objectives: The laboratory focuses on research and education in manufacturing and productivity, as energy is an important component of manufacturing and productivity. It works with industry to develop innovative methods. The M.I.T. Industry Manufacturing Resources Program develops innovative and energy-conserving processes in energy-intensive areas.

X. Lincoln Laboratory

Description/Objectives: This large research institution is operated by M.I.T. in Lexington, Massachusetts. Many projects involve M.I.T. faculty and students. Significant work is being done in the area of photovoltaic systems.

XI. Nuclear Reactor Laboratory

Description/Objectives: The M.I.T. reactor is a versatile research facility at which research projects generally proceed via interaction with other groups. Topics covered are the computer control of power reactors; the health effects of coal combustion; and reactor operation and training.

XII. Operations Research Center

Description/Objectives: This Center includes many research topics related to energy, such as electric utility planning models; models of depletable resources; and mathematical programming techniques applied to integration of a large scale energy model.

XIII. Plasma Fusion Center

Description/Objectives: The Center plays a leading role in the development of the science and technology relevant to plasma physics and eventually to power from controlled nuclear fusion.

XIV. Sea Grant Programs

Description/Objectives: Topics covered include application of teleoperators to undersea tasks and small scale tidal power for eastern New England.

XV. Technology Adaptation Program

Description/Objectives: A project is underway, in conjunction with faculty and students from Cairo University, on long-term investment planning of the Egyptian electrical power system.

NORTHERN ESSEX COMMUNITY COLLEGE

1. Energy-Related Courses
2. Project CONECT

Contact:
Robert McDonald, Dean of Academic Affairs
Northern Essex Community College
100 Elliott Street
Haverhill, Massachusetts 01830
(617) 374-0721

Type of Program:
1. Informal program consisting of courses within the Division of Math, Science and Technology
2. A CETA training program for energy conservation in buildings

Degrees/Diplomas/Certificates: A.A. level

Description/Objectives:
1. The energy-related courses and events have been initiated to broaden the awareness of the community to the concerns of energy conservation and the means of working towards methods of solar use and other energy efficient means of energy generation. The Physical Science course uses concepts of physics and chemistry in elementary solar technology. The Energy and Environment course is designed to explore how homeowners can save heat and energy.
2. CONECT (Consortium on Natural Energy and Conservation Training), a CETA program, spans 42 weeks and is designed to equip the trainee with the necessary trade, academic and experience skills to provide the graduate with alternative energy system design and installation capability. Graduates of the program will be placed in energy-related industry in the area.

Representative Courses:
(1) Energy and the Environment (Math, Science and Technology)
(2) Physical Science (Math, Science and Technology)

Enrollment: 45

Faculty: 2 FT

External Funding: State of Massachusetts

Related Activities:
(1) Energy and the Way We Live—a course by newspaper which explores the history of energy technology and consumption, energy policy, and the relationship of energy problems and national and international events; (2) Workshops on Energy Alternatives—a one-day series of workshops featuring solar energy and co-sponsored by the North East Energy Association; (3) An Energy Management Seminar is conducted in cooperation with the Massachusetts Electric Company and Mount Wachusett Community College.

TUFTS UNIVERSITY

Tufts Energy Management Team
Established March 1980

Contact:
George E. West, Jr., Director
Building and Grounds
Tufts University
Medford, Massachusetts 02155
(617) 628-5000, x222

Type of Program: Formal training program in energy management

Description/Objectives: The Tufts Energy Management Team is a volunteer organization composed mainly of science and engineering students who have had experience with energy technology and are interested in learning more about the technical processes involved in energy conservation. Members of this team take part in a three-part training program designed to teach them how to give energy audits, as well as to satisfy their personal interests in energy conservation technology. A similar program is available for the public, designed to provide energy conservation information to all interested in order to increase energy consciousness in the immediate area. The ultimate goal of this group is to develop the program into an engineering course to remain a permanent part of the engineering curriculum, with emphasis placed on developing measures to conserve energy on campus and, in general, reduce campus energy consumption.

CENTRAL MICHIGAN UNIVERSITY

Energy-Related Courses and Workshops

Contact:
Central Michigan University
Mount Pleasant, Michigan 48859
(517) 774-3151

Type of Program: Informal program consisting of energy-related courses offered mainly by the Department of Industrial Education and Technology and teacher workshops

Description/Objectives: Energy-related courses within the Department of Industrial Education and Technology comprise an Environmental Systems concentration. Additional courses are also given by the Geology and Physics Departments. An Energy Consortium of workshops for junior and high school teachers which had 120 graduate students enrolled during the summer and fall of 1980 is conducted.

Representative Courses:
(1) Alternate Energy Systems
(2) Energy Consortium Workshop

Enrollment: 30

External Funding: Michigan Energy Administration; U.S. Department of Commerce (Energy Consortium)

FERRIS STATE COLLEGE

Energy Institute
Established 1980

Contact:
David Csokasy, Director
Energy Institute
Ferris State College
Swan 108
Big Rapids, Michigan 49307
(616) 796-9971, x466

Type of Program: Formal program consisting of energy-related courses and activities organized as an Institute

Degrees/Diplomas/Certificates: A.A. level

Description/Objectives: The Institute promotes the consolidation of energy education resources. Originally established as an information clearinghouse for printed material developed by Ferris, government agencies, industrial and private sources, the Institute also functions in the following areas: (1) Media development (brochures, instructional materials, how-to items, audio-visuals, etc.); (2) Technical assistance for northwestern Michigan's business, industry and private individuals; (3) Demonstration projects to illustrate energy conservation and energy wise ideas; (4) On-campus technical seminars for Ferris personnel and local residents as well as off-campus technical seminars for statewide coverage; (5) Technical workshops/short courses (on and off campus); (6) In-service/pre-service programs for industrial arts and vocational teachers; (7) Applied research to encourage faculty research; and (8) New course and program development. In addition, a two-year technical program in Refrigeration, Heating and Air Conditioning is offered through the Construction Department and emphasizes installation, service and system operation. This curriculum includes solar and alternate energy applications and concerns itself with practical energy efficiency and management.

Representative Courses:
(1) Energy Conservation in Building Design (Construction)
(2) Energy Use and Conservation (Conservation)
(3) Energy Management (Management)

Related Activities: Various seminars and workshops are conducted, including a summer workshop for secondary and postsecondary teachers on solar system/heat pump technology, with a living and travel allowance, and a two-day conference on alternate energy.

HILLSDALE COLLEGE

Energy-Related Seminars

Contact:
Ronald Trowbridge, Vice President
Hillsdale College
Center for Constructive Alternatives
Hillsdale, Michigan 49242
(517) 437-7341

Type of Program: Informal program consisting of energy-related seminars.

Description/Objectives: These week-long seminars, which are offered four times each academic year, deal with topics of contemporary interest. Two such seminars dealt with the energy issue. "Energy" was offered in 1977 and "The Dilemma of Economic Welfare vs. Ecological Preservation" was offered in 1979. Credit for these seminars can be obtained through the college.

LANSING COMMUNITY COLLEGE

1. Energy-Related Courses
2. Solar Option
Established 1977

Contact:
Lansing Community College
419 North Capitol Avenue
Lansing, Michigan 48901
(517) 374-5087

Type of Program:
1. Informal interdisciplinary program consisting of energy-related courses
2. Formal program offered as a major area of study within the Architectural Program of Engineering Technology

Degrees/Diplomas/Certificates:
2. A.A.S. degree or one-year Certificate

Description/Objectives:
1. Courses and seminars are offered in the Departments of Humanities, Science, Social Science, Engineering Technology, and Applied Technology. The Science and Social Science Departments offer an interdisciplinary course in science technology and change. In the Applied Technology Department, courses in building wind electric generators and solar collectors are conducted. The focus of the Humanities Department has been on community outreach and values as they relate to energy. As part of the Heating and Air Conditioning program, a course in solar installation is being offered to give students an overview of system tapes and installation design details, and to help them learn nuts and bolts hook-up techniques and to install a system on the roof of one of the labs.
2. The Solar Option prepares students for jobs as solar technicians, highly skilled professionals who work directly with architects, professional engineers, heating, ventilating, and air conditioning contractors, and electrical engineers.

Representative Courses:
(1) Our Energy Crisis, or Where Will You Be When The Lights Go Out? (Science and Social Science Departments)
(2) Solar Installation (Heating and Air Conditioning)

MONROE COUNTY COMMUNITY COLLEGE

Energy-Related Courses

Contact:
Audrey Warrick, Assistant Director
Monroe County Community College
1555 South Raisinville Road
Monroe, Michigan 48161
(313) 242-7300, x288

Type of Program: Informal program consisting of energy-related courses offered through continuing education

Degrees/Diplomas/Certificates: Certificate of completion (upon request)

Description/Objectives: This program's energy-related courses give instruction in energy conservation, energy problems and solutions, and the establishment of an ongoing energy management program.

Representative Courses:
(1) Practical Energy Conservation
(2) Energy and the Way We Live (Course by newspaper)

Student Assistance: Senior Citizen Scholarship (tuition only)

External Funding: See Related Activities, below

Related Activities: Energy-related community forums are conducted. Examples: "Energy Crisis: Contrived or Real?"; "Energy Conservation and Lifestyle"; "Monroe County and Lake Erie in the Middle of the Energy Debate". The forums are a program of the American Association of Community and Junior Colleges with funding from the National Endowment for the Humanities and the U.S. Department of Energy. Community forums are made possible by a grant and from the Michigan Council for the Humanities, co-sponsored by Monroe County Library System, City of Monroe, County of Monroe, Ford Motor Company, Monroe County Chamber of Commerce, Monroe Environmental Corporation, Detroit Edison Company, Michigan Gas Utilities Company, and Consumer Power Company.

OLIVET COLLEGE

Self-Sufficiency Center
Established September 1979

Contact:
Burton V. Swan, Director
Physical Plant
Olivet College
Olivet, Michigan 49076
(616) 749-7646

Type of Program: Informal program organized as a Center

Description/Objectives: The Center is organized to disseminate information and practical techniques in alternative self-help lifestyles to the college community and local public. The Center keeps up to date with popular literature and technical journals, and when an idea or product has possibilities of adaptation on a local level, it is followed up by experimentation. Of particular concern are the areas of energy conservation and small-scale generation, home health care, and food production, preservation, and preparation. The Center maintains a small library of reference volumes, pertinent periodicals, and manufacturers' literature; a solar greenhouse is nearly completed; a fuel-alcohol still is being constructed for the conversion of locally produced grain to fuel; and the construction of a combination solar-wood hot water system is underway.

Enrollment: 3 PT

Faculty: 5 PT

Annual Budget: $500

SCHOOLCRAFT COLLEGE

Energy Conservation Auditors Program
Established Winter 1981

Contact:
Fernon Feenstra
Schoolcraft College
18600 Haggerty Road
Livonia, Michigan 48512
(313) 591-6400

Type of Program: Formal interdepartmental program, structurally autonomous, based principally on specializations within the Departments of Architecture and Climate Systems Technology, with additional courses in Physics, Geology, and Economics

Degrees/Diplomas/Certificates: A.A.; Certificates in Heating and in Refrigeration

Description/Objectives: Energy Conservation Auditors is a formal program leading to a certificate. The primary objective of this program is to be able to provide trained energy auditors for business, industry, institutions, and government.

Representative Courses:
(1) Conditioned Air Engineering Refrigeration I & II (Climate Systems Technology)
(2) Basic Heating (Climate Systems Technology)
(3) Construction Systems I & II (Architecture)
(4) Environmental Systems (Architecture)
(5) Architectural Drawing II & III (Architecture)

Enrollment: 80

Faculty: 4 FT

Research: Passive Solar (Architecture Department); Experimental Solar (Climate Systems Technology Department)

Research Funding: University and matching State equipment funds

Related Activities: A one-day solar energy seminar is conducted in cooperation with the Detroit Chapter of Refrigeration Service Engineers Society. The State Department of Commerce conducts campus seminars for students.

CARLETON COLLEGE

Science, Technology, and Public Policy Program
Established Fall 1981

Contact:
Mylla Urban, Associate Dean
Carleton College
Northfield, Minnesota 55057
(507) 663-4299

Type of Program: Formal interdisciplinary program which is a concentration involving the Natural Sciences, Social Sciences, and Humanities

Description/Objectives: This program is designed to give students in the Natural Sciences experience and analytical skills in dealing with policy issues, and conversely, students in the Social Sciences and Humanities familiarity with science and technology policy. Students may elect an energy emphasis within this specialization.

Representative Courses:
(1) Energy Policy
(2) Seminar: Energy and Environment
(3) Seminar: Approaches to Energy Conservation

COLLEGE OF ST. THOMAS

Energy Management Specialization (Graduate)
Established Summer 1979

Contact:
Eugene R. Kotz, Dean
Graduate Programs in Management
Daniel E. McNamara, Assistant Professor
College of St. Thomas
St. Paul, Minnesota 55105
(612) 647-5327

Type of Program: Formal program which is a specialization offered within the M.B.A. Program

Degrees/Diplomas/Certificates: M.B.A., Specialization in Energy Management

Description/Objectives: This program is designed to fulfill the need for effective energy management, including determining availability, developing alternate energy sources, and conservation and utilization. The primary goal is to provide managers and administrators with the necessary knowledge to make effective decisions on behalf of their organizations as the cost and supply of energy rapidly change. In Technical Aspects of Energy Management, course topics include energy accounting, coal conversion, nuclear energy, solar energy, alternatives such as wind and biomass, and energy audits. The Legal, Social, and Economic Aspects of Energy Management course investigates problems in the international/national/local context, the economics and regulatory issues for specific fuels and technologies, politics and public policy, management in uncertainty, corporate goals and objectives in energy, private sector initiative, and investment strategies. The objective of Organizational Aspects of Energy Management is to acquaint middle managers with the knowledge of energy conservation and use in the most economic means within the industrial, commercial, and residential sectors. In order to fulfill the requirements of the Energy Management specialization, students must complete the three specialization courses in addition to the usual requirements of the M.B.A. Program.

Representative Courses:
(1) Technical Aspects of Energy Management
(2) The Legal, Social, and Economic Aspects of Energy Management
(3) Organizational Aspects of Energy Management

LAKEWOOD COMMUNITY COLLEGE

Energy Conservation Technology Program
Established Fall 1980

Contact:
Robert Wischmann, Instructor
Lakewood Community College
3401 Century Avenue North
White Bear Lake, Minnesota 55110
(612) 770-1331

Type of Program: Formal, degree granting, autonomous program within the Department of Natural Science, in cooperation with a local vocational-technical school

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This two-year program provides a broad, comprehensive background in energy use and conservation, particularly in relation to buildings. Practical hands-on instruction is offered in order to give students experience with equipment and systems involved in using energy. Courses cover alternate energy development, including solar direct, photovoltaics, wind and other renewable energy sources. An overview is given regarding energy sources such as geothermal and wood burning and methane production.

Representative Courses:
(1) Energy Concepts
(2) Introduction to Alternate Energy Sources
(3) Energy Information Resources
(4) The Minnesota Energy Code
(5) Energy Self-Audit
(6) Introduction to Microprocessing
(7) Energy Seminars

Enrollment: 23

Related Activities: Energy-related courses in Adult Education are also conducted.

ST. OLAF COLLEGE

Energy-Related Course

Contact:
H.B. Keller
St. Olaf College
Northfield, Minnesota 55057
(507) 663-3121

Type of Program: Informal program consisting of one course in the Physics Department

Description/Objectives: This Physics course is primarily a sensitivity-raising course exploring pertinent energy issues.

Representative Course: What Do We Do When the Oil Runs Out?

Enrollment: 10–15

NORTHWEST MISSISSIPPI JUNIOR COLLEGE

Energy-Related Courses and Energy-Related Research

Contact:
J.D. Ross, Chairman
Science Department
Northwest Mississippi Junior College
Senatobia, Mississippi 38668
(601) 562-5262, x227

Type of Program: Informal program consisting of energy-related courses offered by the Science Department

Description/Objectives: The curriculum in energy offered by the Science Department is concerned with innovation in its educational approach. The involvement of students is emphasized in the construction of work models and teaching aids. Students design and develop equipment for use in laboratory studies. These courses cover a variety of energy-related topics, particularly in the area of solar energy.

Representative Courses:
(1) Solar Devices
(2) Fundamentals of Solar Energy
(3) Solar Energy Systems I and II

Research: The demonstration project of the design and construction of a solar photovoltaic system

Research Funding: U.S. Department of Energy

UNIVERSITY OF SOUTHERN MISSISSIPPI

Energy-Related Courses

Contact:
C. Howard Heiden, Chairman
Department of Industrial Technology
University of Southern Mississippi
Southern Station
Box 5172
Hattiesburg, Mississippi 39401
(601) 266-4293

Type of Program: Informal program consisting of energy-related courses within the Departments of Industrial Technology and Mechanical Technology

Description/Objectives: These courses explore issues concerning solar energy as well as alternate energy systems.

Representative Courses:
(1) Solar Heating and Cooling (Mechanical Technology)
(2) Alternate Energy (Industrial Technology)

UNIVERSITY OF MISSOURI–COLUMBIA

1. Energy-Related Courses
Established 1979

Contact:
Harold F. Breimyer, Chairman
Committee on Energy
214 Mumford Hall
University of Missouri—Columbia
Columbia, Missouri 65211
(314) 882-7226

Type of Program: Informal interdisciplinary program consisting of a wide variety of energy-related courses

Degrees/Diplomas/Certificates: B.A., B.S. levels

Description/Objectives: This university-wide energy focus involves course offerings in the Natural Sciences, Social Sciences, and Engineering disciplines. Courses cover a variety of topics and are grouped under interdepartmental headings listed below.

Representative Courses:

Interdisciplinary Survey Courses:
(1) Perspectives of Energy (Forestry-Fisheries-Wildlife)
(2) America's Environmental Experience (History)

Basic Sciences in Energy and Energy Engineering:
(1) Engineering Evaluation of Energy Systems and Resources (Electrical, Nuclear, and Mechanical & Aerospace Engineering)
(2) Economics of Power Systems (Electrical Engineering)
(3) Principles of Direct Energy Conversion (Mechanical & Aerospace Engineering)

Energy in Agricultural Production and Processing:
(1) Bioenergetics (Dairy Husbandry)
(2) Electricity on the Farm (Agricultural Engineering)

Energy in Food Systems, Home Living:
(1) Development, Utilization and Maintenance of Physical Resources (Human Nutrition)

Energy Conservation in Home Design:
(1) Energy Conserving Homes (General Honors)

Energy Conservation in Building Design (except homes):
(1) Heating and Air Conditioning (Mechanical & Aerospace Engineering)

Solar Energy:
(1) Solar Energy: Theory and Application (General Honors)

continued

Nuclear Power:
(1) Natural Resource and Nuclear Engineering (Nuclear Engineering)

Energy and Ecology:
(1) Basic Environmental Studies (Biological Sciences)

Energy and Human Behavior, Sociology, Politics:
(1) Energy Consumption and Social Behavior (Sociology)

Energy and Education—Industrial Education:
(1) Energy and Power Technology (Practical Arts and Vocational-Technical Education)

Energy Policy:
(1) Energy Systems and Resources: Risks and Benefits (Nuclear Engineering)

Research: Energy research in course related areas

Related Activities: Energy-related senior-citizen, consumer education, and community activities are also conducted.

UNIVERSITY OF MISSOURI—COLUMBIA—continued

2. Family Energy Project
Established 1980

Contact:
Marilyn Caselman, Professor
Home Economics
University of Missouri—Columbia
162 Stanley Hall
Columbia, Missouri 65211
(314) 882-3854

Type of Program: Informal program offered to adults and youth through extension service

Description/Objectives: This program involves departments within the College of Home Economics. The primary objective of the program is energy education for the family and home, with an emphasis on conservation. The program's goal is to achieve increased awareness, more responsible citizenship, and an increased knowledge of conservation measures, particularly in the home.

Faculty: 1 FT; 20 PT area specialists

Annual Budget: $86,000

External Funding: U.S. Department of Energy

UNIVERSITY OF MISSOURI–COLUMBIA-continued

3. Energy Emphasis
Established Fall 1980

Contact:
Michael Dyrenfurth, Associate Professor
Industrial Education Department
University of Missouri—Columbia
103 Industrial Education
Columbia, Missouri 65211
(314) 882-3082

Type of Program: Formal program consisting of an energy emphasis within the Industrial Education Department

Description/Objectives: This program is a planned sequence consisting of four courses that introduce students to the energy and power cluster of technology through lectures and laboratory experiences in energy, power, instrumentation, and control. The goal of the program is to develop an understanding, both of a conceptual and technical nature, and competencies in energy, power, instrumentation, and control.

Representative Courses:
(1) Energy and Power Technology
(2) Alternative Energy Technology
(3) Power Technology
(4) Applied Electricity and Electronics

Enrollment: 10

Faculty: 2 FT

WASHINGTON UNIVERSITY

1. Energy, Resource and Environmental Studies
2. Energy Engineering Policy Program

Contact:
1. Robert P. Morgan, Chairman
Department of Technology and Human Affairs
Washington University
Box 1106
St. Louis, Missouri 63130
1. (314) 889-5455
2. (314) 889-5000

Type of Program:
1. Formal program, at both the undergraduate and graduate levels, which is a concentration within the Department of Technology and Human Affairs
2. Formal interdisciplinary program offered through the School of Engineering

Degrees/Diplomas/Certificates:
1. B.S.; B.S. in Engineering and Public Policy; M.S.; M.A. and D.Sc.
2. B.S.; Certificate

Description/Objectives:
1. This program is a focal point for teaching and research on the application of science and technology to contemporary problems, the assessment of the effects of technology, and the analysis of public policy issues with significant technological components. Within this concentration the following additional courses of study are offered: (1) Environmental Quality, Planning and Policy Analysis; and (2) Renewable and Non-Renewable Resource Technology Policy and Management.
2. This program consists of a three-part energy core curriculum comprised of (1) energy-related engineering courses; (2) energy-policy related courses; and (3) the political, social, economic, and environmental aspects of energy technologies. This combination of a sound technical training and an ability to analyze the non-technical aspects of energy problems prepares students for a variety of career options.

Representative Courses:
1. Graduate Courses are:
(1) Alternative Sources of Energy (Technology and Human Affairs)
(2) Energy and Materials Technology, Resources and Policy (Technology and Human Affairs)
(3) Technology and Policy for Resource Management (Technology and Human Affairs)
(4) Energy Effective Building Design (Architecture)
(5) Research Workshops in Energy and Environment (Economics)
(6) Topics in American Politics: U.S. National Energy Policy (Political Science)

continued

Undergraduate courses are:
(1) Solar Energy Technology and Policy (Technology and Human Affairs)
(2) Energy and Human Values (Technology and Human Affairs)

2. (1) Energetics for Mechanical Engineering (Mechanical Engineering)
(2) Solar Energy Technology and Policy (Technology and Human Affairs)
(3) Economics of Environment and Resources (Economics)
(4) Policy, Politics and Technology (Political Science)

Student Assistance:
1. Graduate fellowships and graduate research and teaching assistantships

Research:
1. The Center for Development Technology, established in 1968, serves as a focal point for interdisciplinary research concerned with the application of technology to social problems in many areas, including the following in energy: (1) Appropriate Technology for Renewable Resource Utilization—Five topical areas were examined in some detail: wind energy, improved cookstoves, solar drying, rice bran processing, and materials and products from agricultural wastes; (2) Solar Technology Inventory for the Mid-American Region—This inventory was designed to compile information from solar equipment manufacturers that describes the type, application, performance, price, usage, and availability of low- and medium-temperature solar products; and (3) The Energy Crisis and the Motorist—An analysis of the factors that influence supply and demand for motor gasoline was designed in order to better understand the conditions surrounding the great "gasoline shortage" of 1973-74.

Research Funding: Sponsors for the above are: (1) Agency for International Development; (2) Central Solar Energy Research Institute and the U.S. Department of Energy; and (3) Automobile Club of Missouri.

NEW HAMPSHIRE VOCATIONAL-TECHNICAL COLLEGE

Solar Energy Technician and Energy Conservation Use Technician Program
Established Fall 1982 (Proposed)

Contact:
Raymond T. Hubbard, Dean of Instruction
New Hampshire Vocational-Technical College
1066 Front Street
Manchester, New Hampshire 03031
(603) 668-6706

Type of Program: Formal interdisciplinary program within the Department of Construction Technology

Degrees/Diplomas/Certificates: A.A.; A.A.S.; and Solar Energy Certificate

Description/Objectives: The proposed Solar/Conservation program will involve courses from the Physics, Economics, and Construction Technology Departments, as well as courses in the Humanities. A variety of courses will be offered in the following areas: Air Conditioning/Refrigeration; Architectural Drafting; Heating Services; Industrial Electricity; and Industrial Electronics. In the interim, energy courses and an evening Solar Energy Certificate Program are offered.

Representative Courses:
(1) Energy Survey and Alternative Systems
(2) Energy Conservation: Principles and Practices
(3) Solar Energy: A Prime Resource
(4) Principles of Solar Design
(5) Solar Construction and Installation Techniques
(6) Solar Heating Systems

Faculty: 4 FT

External Funding: State

Related Activities: Energy-related adult and consumer education activities are also conducted.

UNIVERSITY OF NEW HAMPSHIRE

1. Energy Program in Civil Technology

Contact:
Guy Petty, Assistant Professor
Thompson School of Applied Science
University of New Hampshire
Barton Hall
Durham, New Hampshire 03824
(603) 862-1035

Type of Program: Formal program that is a specialization within the Department of Civil Technology

Degrees/Diplomas/Certificates: A.A.S. (Civil Technology)

Description/Objectives: This fourteen-credit specialization is specifically designed to qualify successful students as energy technicians. As energy technicians, students should be prepared to do the following: evaluate a home or business and determine the measures necessary for making it energy-efficient; compare costs and savings and carry out much of the needed work; and check and improve the efficiency of heating systems, cooling systems, and mechanical systems.

Representative Courses:
(1) Energy Conservation
(2) Energy Systems
(3) Alternate Energy Systems

Enrollment: 20

Faculty: 2 FT

Student Assistance: Regular assistance

Related Activities: A class for alumni entitled, "Utilization of Alternative Energy Sources," is also conducted.

UNIVERSITY OF NEW HAMPSHIRE—continued

2. Energy Options in Chemical Engineering and Mechanical Engineering

Contact:
Ellen M. Conklin, Institutional Research Assistant
University of New Hampshire
302 Thompson Hall
Durham, New Hampshire 03824
(603) 862-2410

Type of Program: Formal programs within the College of Engineering and Physical Sciences

Degrees/Diplomas/Certificates: B.A.; B.S.

Description/Objectives:
1. Chemical Engineering—courses provide students with a general background knowledge of fossil fuels, nuclear power, solar energy, and other alternative resources. Elective courses in this option enable students to conduct a more in-depth examination of topics of particular interest.
2. Mechanical Engineering—this formal option is designed to provide students with a well planned program with the chief emphasis on courses that relate to energy-related industries. In addition, students are expected to gain an understanding of the engineering aspects of energy systems.

Representative Courses: Required courses include:
(1) Natural and Synthetic Fossil Fuels (Chemical Engineering)
(2) Introduction to Nuclear Engineering (Chemical Engineering)
(3) Solar Heating Systems (Mechanical Engineering)
(4) Thermodynamics (Mechanical Engineering)
(5) Seminar—Energy Topics (Mechanical Engineering)

Student Assistance: Regular assistance

CAMDEN COUNTY COLLEGE

Energy Technology Program
Established Fall 1980

Contact:
Milton Somers, Assistant Professor
Chemistry Department
Camden County College
Blackwood, New Jersey 08012
(609) 227-7200, x479

Type of Program: Formal program that is a specialization within the Engineering Technology Department

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This option, within Electromechanical Engineering Technology, provides students with a broad background for entering a variety of energy-related fields. The program includes study in economics, audits, and computers.

Representative Courses:
Required courses are:
(1) Heating and Power (Engineering)
(2) Economics and Audits (Economics)
(3) Microcomputers (Engineering)
(4) Heating, Ventilating and Air Conditioning (Engineering)
(5) Hybrid Systems (Engineering)

Faculty: 5 FT, 2 PT

Annual Budget: $25,000

MERCER COUNTY COMMUNITY COLLEGE

Solar Project
Established 1979

Contact:
Robert Duncan, Associate Professor
Mercer County Community College
P.O. Box B 1200 Old Trenton Road
Trenton, New Jersey 08690
(609) 586-4800

Type of Program: Informal program consisting of a solar project conducted by the Engineering Club

Description/Objectives: Members of the Engineering Club built a solar tracking furnace, a project undertaken by the Club for its own edification and for the benefit of those students studying energy.

RAMAPO COLLEGE OF NEW JERSEY

1. Energy Concentration
2. Alternate Energy Center

Contact:
William Makofske, Program Director and Physics Professor
Ramapo College of New Jersey
School of Environmental Studies
505 Ramapo Valley Road
Mahwah, New Jersey 07430
(201) 825-2800

Type of Program:
1. Formal program consisting of a concentration offered within the Environmental Studies major
2. Formal program consisting of a joint faculty-student project and organized as a Center

Degrees/Diplomas/Certificates: B.A. in Environmental Studies

Description/Objectives:
1. The energy concentration, one of four concentrations offered to the Environmental Studies major, is designed to provide students with knowledge and skills needed for informed decision making and creative problem solving in the energy area by integrating appropriate scientific, social, and policy components within an undergraduate liberal arts curriculum. Students participate in field work and internships that give practical experience in dealing with real world energy problems.
2. The three major goals of the Center are to serve as an educational facility for both students and faculty; to serve as an outreach facility to the local community; and to encourage research and development of small-scale, renewable energy alternatives. It focuses upon energy alternatives through project work by allowing students to develop their own research projects as well as to participate in workshops at the Center. A solar greenhouse has been constructed at the Center, and a wind generator provides electricity.

Enrollment:
1. 50

Annual Budget: $15,000

SALEM COMMUNITY COLLEGE

Energy Technology Program
Established Fall 1980

Contact:
Sam Tillis
Salem Community College
P.O. Box 551
Penns Grove, New Jersey 08069
(609) 299-2100

Type of Program: Formal program within the Department of Applied Science and Technology

Degrees/Diplomas/Certificates: A.A.; A.A.S.; Certificate

Description/Objectives: This energy option, offered through the Department of Applied Science and Technology, is a two-semester program consisting of an eight-course cluster. A variety of energy-related topics are covered, including solar energy and energy conservation.

Representative Courses: Required courses are:
(1) AC Controls (Applied Science & Technology)
(2) Process Instruction I (Applied Science & Technology)
(3) Energy Conservation (Applied Science & Technology)
(4) Electrical Wiring (Applied Science & Technology)
(5) Process Instruction II (Applied Science & Technology)
(6) Solar Energy (Applied Science & Technology)
(7) Computer Applications (Arts and Sciences)
(8) Math Applications (Arts and Sciences)

Enrollment: 10

Faculty: 2 FT, 1 PT

Student Assistance: Federal programs, student work study

Related Activities: Energy-related extension courses and community activities are also conducted.

GRANTS BRANCH COMMUNITY COLLEGE OF NEW MEXICO STATE UNIVERSITY

Energy and Our Area Series

Contact:
Lucy Belle Ma, Coordinator of Community Education/Service
Grants Branch Community College of New Mexico State University
1500 Third Street
Grants, New Mexico 87020
(515) 287-7981

Type of Program: Formal program consisting of energy-related classes offered by the Community Education Department

Degrees/Diplomas/Certificates: Certification of Completion

Description/Objectives: This series of twelve classes was designed to give area residents a clearer understanding of regional and nationwide energy issues. Companies were invited to participate by providing specialists to speak and by supplying various audiovisuals such as films and slides.

NEW MEXICO HIGHLANDS UNIVERSITY

Northern New Mexico Energy Education Project

Contact:
Orval D. Hughes, Project Director
Northern New Mexico Energy Education Project
New Mexico Highlands University
Las Vegas, New Mexico 87701
(505) 425-7511

Type of Program: Formal graduate program consisting of workshops and follow-up activities

Degrees/Diplomas/Certificates: Master's level

Description/Objectives: This program was designed to provide in-service training to teachers at the elementary and junior high school levels in the area of energy education. The program is made up of both workshops and follow-up activities. Teachers are awarded one graduate credit for workshop participation. One graduate credit is also given in cases where follow-up activity is accompanied by suitable documentation. Follow-up activities include a community survey on energy conservation conducted by a sixth grade class; parental involvement with children on home energy conservation efforts; and poster contests and energy fairs.

Enrollment: 110

External Funding: U.S. Department of Energy

ADIRONDACK COMMUNITY COLLEGE

Energy-Related Courses
Established Fall 1979

Contact:
Charles Harrington
Adirondack Community College
Bay Road
Glens Falls, New York 12801
(518) 747-0274

Type of Program: Formal program, in cooperation with Mohawk Valley Community College, that is a specialization within the Department of Occupational Education

Degrees/Diplomas/Certificates: Certification

Description/Objectives: The main objective of this program is to provide students with the necessary background for careers as energy technicians. The program focuses primarily on energy auditing and management, as well as solar energy.

Representative Courses:
(1) Energy Management
(2) Solar Energy

Enrollment: 10

Faculty: 1 FT

Related Activities: Energy-related adult and consumer education, professional training courses, and community activities are also conducted.

COLUMBIA UNIVERSITY

1. Nuclear Engineering
2. Power Generation and Energy Conversion
3. Electric Energy Systems
Established **1.** *1955;* **2.** *1974;* **3.** *1974*

Contact:
1. R.A. Gross, Professor
2. H. Elrod, Professor
3. S.P. Schlesinger, Professor
School of Engineering and Applied Science
Columbia University
510 S.W. Mudd Building
New York, New York 10027
1. (212) 280-2967
2. (212) 280-2965
3. (212) 280-3103

Type of Program:
1. Formal program in Applied Physics and Nuclear Engineering which is an autonomous department
2. Formal program which is a concentration in Mechanical Engineering
3. Formal program which is a concentration in Electrical Engineering

Degrees/Diplomas/Certificates: B.S., M.S., Ph.D. and Eng. Sc. D. levels

Description/Objectives: These energy-related programs cover a variety of topics, including solar energy, nuclear energy, and energy sources. In addition to course offerings, energy-related research is conducted by the Columbia Energy Research Center, the Plasma Laboratory, and the Fossil Energy Laboratory. The aim of these programs is to prepare students for careers in the engineering profession or applied sciences.

Representative Courses:
(1) Nuclear Energy for Concerned Citizens (Applied Physics and Nuclear Engineering)
(2) Controlled Fusion Reactor Technology (Applied Physics and Nuclear Engineering)
(3) Applications of Solar Energy (Mechanical Engineering)
(4) Energy Sources and Conversion (Mechanical Engineering)
(5) Metal Production and the Environment (Mineral Engineering)

Student Assistance: Graduate assistantships for research

Research: Columbia Energy Research Center-various topics; Plasma Laboratory-fusion energy; Fossil Energy Laboratory-coal gasification

Research Funding: Corporate; U.S. government; and State government.

CORNELL UNIVERSITY

Energy-Related Courses

Contact:
Sally Sanderson, Staff Assistant
Institutional Planning and Analysis
B-7 Day Hall
Cornell University
Ithaca, New York 14853
(607) 256-7540

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: This program consists of a broad, diverse range of energy-related courses involving various schools and departments. Topics such as energy resources, projected consumption, and the efficiency and economics of fuel production/use are covered.

Representative Courses:

1. College of Agriculture and Life Sciences
   I. Department of Public Policy:
      (1) Economic Aspects of Energy Use
      (2) Introduction to Energy Resources
   II. Department of Agricultural Engineering:
      (1) Energy and Man
      (2) Internal Combustion Engines for Agriculture

2. College of Architecture, Art, and Planning
   I. Department of Architectural Science and Technology:
      (1) Environmental Controls
      (2) Environmental Technology Workshop
      (3) Special Problems in Architectural Science

3. College of Arts and Sciences
   I. Department of Government:
      (1) Energy and American Politics
      (2) International Politics of Energy

4. College of Engineering
   I. Department of Applied and Engineering Physics:
      (1) Introduction to Nuclear Science and Engineering
      (2) Introduction to Plasma Physics
      (3) Nuclear Reactor Theory
      (4) Nuclear Reactor Engineering
   II. Department of Chemical Engineering:
      (1) Synthetic Fuels
      (2) Mass and Energy Balances

III. Department of Civil and Environmental Engineering:
(1) Environmental Planning and Operation of Energy Facilities
(2) Environmental Effects of Energy Conversion
IV. Department of Electrical Engineering:
(1) Advanced Power Systems Analysis
(2) Introduction to Plasma Physics
V. Department of Geological Sciences:
(1) Mineral and Energy Resources and the Environment
(2) Petroleum Geology
VI. Department of Materials Science and Engineering:
(1) Solar Energy Materials
(2) Advanced Topics in Mechanical Properties
VII. Department of Physics:
(1) Energy
(2) High-Energy Particle Physics

5. Graduate School of Business and Public Administration
I. Department of Public Administration
(1) Energy and Public Policy
(2) Science, Technology and Public Policy

6. Law School
(1) Environmental Law
(2) Energy Regulation

Related Activities: Energy-related extension courses are carried out in conjunction with the Design and Environmental Analysis Department.

ERIE COMMUNITY COLLEGE

1. Energy-Related Courses
2. Energy Communications Center
Established
2. *May 1980*

Contact:
David Kowalczyk, Dean of Finance
Erie Community College/Central Staff
4140 Southwestern Boulevard
Orchard Park, New York 14127
(716) 648-5400, x208

Type of Program: Informal program consisting of energy-related courses and an Energy Communications Center

Degrees/Diplomas/Certificates: A.A. level

Description/Objectives:
1. Energy-related courses are given in Heating/Air Conditioning and Refrigeration and Solar Energy.
2. The Energy Communications Center was established for the three Erie Community College campuses. Goals of the Center include: the establishment of a network of faculty and administrators interested in energy problems; collecting and distributing information concerning energy-education programs, funding possibilities, resource guides, and training workshop opportunities to promote energy awareness; and the development of a plan for using that information in energy education at Erie Community College.

Representative Courses:
(1) Solar Energy (Mechanical Technology)
(2) Energy and Environment (Science)

Enrollment: 60

Faculty: 2 FT

Annual Budget: $2,500

External Funding Sources: State; county

HAMILTON COLLEGE

Energy-Related Courses

Contact:
J.W. Ring, Professor of Physics
Hamilton College
Clinton, New York 13323
(315) 859-7510

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: This informal interdisciplinary program involves the Departments of Physics, Geology, and Government. In addition, "Physics of Energy" uses a solar classroom as its laboratory.

Representative Courses:
(1) Physics of Energy (Physics)
(2) Earth Resources (Geology)
(3) Science, Technology and Public Policy (Government)

Related Activities: Energy activities including an Elder-hostel Program, which makes use of the "Solar Classroom," and various community programs, particularly in regard to solar heating and energy, are also conducted.

HUNTER COLLEGE

Energy Policy Studies
Established September 1980

Contact:
Stephanie Swartout, Administrative Assistant
Energy Policy Studies
Hunter College, City University of New York
Box 341 L
695 Park Avenue
New York, New York 10021
(212) 570-5583

Type of Program: Formal interdisciplinary program organized as a collateral major

Degrees/Diplomas/Certificates: B.A. level

Description/Objectives: This eighteen-credit collateral major is intended to supplement a traditional major. The focus of the program is on the critical relationships between energy and society, particularly in the policy-making process. Students are provided with a range of analytical tools for careful examination of a growing body of information in order to better understand public policy and to contribute to students' roles as citizens and decision makers.

Representative Courses: Required courses include:
(1) The Human Uses of Energy (Energy Policy Studies)
(2) Policy Problems of Energy (Energy Policy Studies)
(3) Energy, Economics, and Policy (Economics)
(4) Energy Planning and Policy Seminar (Urban Affairs)
(5) Power Struggles: Citizen Organizations and Social Issues in Energy (Sociology)

Enrollment: 30

Faculty: 15

Annual Budget: $12,744

Related Activities: Energy-related community activities are also conducted.

MOHAWK VALLEY COMMUNITY COLLEGE

Solar Energy Technology Program
Established September 1979

Contact:
Francis Dunning, Director
Energy Applications Laboratory
Mohawk Valley Community College
1101 Sherman Drive
Utica, New York 13501
(315) 792-5514

Type of Program: Formal certificate program that is a specialization within the Department of Physics

Degrees/Diplomas/Certificates: Solar Energy Technology Certificate

Description/Objectives: This one-year certificate program has as its main objective the training of technicians to design, install, and service solar energy systems. Both theory and practical aspects of the field are explored.

Representative Courses: Required courses are:
(1) Solar Energy I—Solar Energy and Conservation
(2) Solar Energy II—Sizing, Installation and Maintenance
(3) Solar Energy III—System Design and Analysis
(4) Solar System Fabrication I & II
(5) Alternate Energy Systems

Enrollment: 15

Faculty: 1 FT, 3 PT

Annual Budget: $50,000

External Funding: Federal government—$25,000

Related Activities: Solar Now, an intensive six-day course on the practical aspects of residential solar heating and cooling (supported by federal funds under Title I of the Higher Education Act of 1965) is also conducted.

NEW YORK INSTITUTE OF TECHNOLOGY

Energy Management Program

Established September 1981 (proposed)

Contact:
Gale Tenen Spak, Deputy Director
Center for Energy Policy and Research
New York Institute of Technology
Old Westbury, New York 11568
(516) 686-7578

Type of Program: Formal interdisciplinary graduate degree program

Degrees/Diplomas/Certificates: M.S.

Description/Objectives: The program is designed to combine management and technical training in an interdisciplinary integrated curriculum to ensure that graduates are prepared to serve the daily increasing need of industry, public institutions, and government to control energy resources and to assess the economic, political, environmental and social effects of energy choices.

Representative Courses: Required courses will include:
(1) Energy Policy I and II
(2) Energy Management I and II
(3) Survey of Modern Energy Technology

Research: Information research and dissemination activities are undertaken to assist public, quasi-public and private-sector organizations in the practical utilization of current knowledge in the energy conservation and alternative energy fields.

Research Funding: Federal/state funds; and private sources

Related Activities: Energy-related consumer education, community activities and outreach programs also conducted.

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NEW YORK UNIVERSITY

1. Joint Degree in Energy Management (Graduate)
2. Energy-Related Courses
Established
1. 1979

Contact:
Jonas Prager, Director of Graduate Studies
New York University
15-19 West 4th Street
New York, New York 10003
(212) 598-3978

Type of Program:
1. Formal interdisciplinary graduate joint-degree program involving the Departments of Applied Sciences and Economics
2. Informal interdisciplinary program consisting of energy-related courses involving the Departments of Physics, Economics, Technology and Industrial Engineering and Biology

Degrees/Diplomas/Certificates:
1. M.A. (Economics); M.S. (Energetics)

Description/Objectives:
1. The primary objective of this program is to train graduate students at the M.A. level in energy management.
2. These energy-related courses cover a variety of topics.

Representative Courses:
1. Required courses in Energy Management are:
(1) Energy Sources I & II (Applied Sciences)
(2) Pollution Sources I (Applied Sciences)
(3) Energy Conservation (Applied Sciences)
(4) Seminar in Energetics (Applied Sciences)
(5) Microeconomics (Economics)
(6) Macroeconomics (Economics)
(7) Statistics I & II (Economics)

2. Energy related courses are:
(1) Energy and Man (Physics)
(2) Energy Options for the Individual (Technology and Industrial Education)
(3) Economics of Energy (Economics)
(4) Mineral and Energy Resources (Geology-Earth and Environmental program, Biology Department)
(5) Ethical Considerations in Developing Energy Policy (Economics)

Related Activities: The course offering, "The Politics of Energy," is conducted through continuing education.

POLYTECHNIC INSTITUTE OF NEW YORK

Energy Engineering and Policy Program
Established 1975

Contact:
Richard S. Thorsen, Head
Department of Mechanical and Aerospace Engineering
Chairman
Energy Engineering and Policy Program
Polytechnic Institute of New York
333 Jay Street
Brooklyn, New York 11201
(212) 643-5044

Type of Program: Formal interdepartmental program administered by the Division of Engineering

Degrees/Diplomas/Certificates: M.S.; Certificate in Energy Engineering and Policy

Description/Objectives: This program provides cohesive curricular, research, and service activities in technological, economic, social, political, and humanistic areas. It is designed to offer a conventional professional education in a single discipline, combined with studies in a wider range of present-day and future energy technologies, economic considerations, environmental constraints, and policy questions. Student projects are derived from ongoing sponsored research, representative examples of which are listed below. Candidates in the Master of Science degree program may receive the M.S. degree in one of nine engineering fields, management or physics, in conjunction with a Certificate in Energy Engineering and Policy. Students may choose to opt for the certificate alone, in which case there are certificate program requirements to fulfill: the completion of two required courses, six units of energy electives from a single energy category; plus two general elective courses in the energy program.

Enrollment: 60

Faculty: 12 FT; 2 PT

Research: (1) Energy Audit, Conservation and Retrofit Study of New York City Hi-Rise Residential Projects; (2) Energy Conservation and Related Benefits of Using Alcohol Blends in New York State; (3) Fuel Conservation by Improved Boiler Techniques; (4) Investigations of Energy-Related Legislation, Codes, Standards, Rules and Regulations; (5) A Technological Evaluation of Projects for Adapting Existing Civil Works in Hydropower Expansion and Development Projects; (6) A Study of the Optimal Electrical-Storage Expansion Plan for the New York Power Pool; (7) Improvements in Electric Power System Security by the Use of Optical Fiber Communications

Research Funding: U.S. Department of Energy and New York State Energy Research and Development.

STATE UNIVERSITY OF NEW YORK AGRICULTURAL AND TECHNICAL COLLEGE

Alternate Energy Concentration

Established September 1980

Contact:
Harry King, Professor and Chairman
Air Conditioning Department
State University of New York Agricultural & Technical College
Canton, New York 13617
(315) 386-7215

Type of Program: Formal program that is a concentration within the Air Conditioning Technology program

Degrees/Diplomas/Certificates: A.A.S. level

Description/Objectives: This concentration in energy is a four course sequence within the Air Conditioning program. It is designed to give students background in the design and application of solar energy systems, energy conservation and energy audits.

Representative Courses: Required courses are:
(1) Introduction to Energy Sources
(2) Active and Passive Energy Systems I & II
(3) Energy Use Management

Faculty: 3 FT

External Funding: State

STATE UNIVERSITY OF NEW YORK AT BINGHAMTON

Energy-Related Courses

Contact:
Natalie M. Kazmierski
Office of Academic Evaluation
State University of New York at Binghamton
Binghamton, New York 13901
(607) 798-2709

Type of Program: Informal interdisciplinary program consisting of energy-related courses on both the undergraduate and graduate levels

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives: Energy-related courses can be found in the following departments and programs: Department of Geological Sciences and Environmental Studies; Department of Economics; Department of Physics, Applied Physics and Astronomy; Department of Geography; the Environmental Studies Program; the Bachelor of Technology Program; School of General Studies and Professional Education; School of Management; Geography Program (Graduate); and Geological Sciences Program (Graduate).

Representative Courses:
(1) Energy Resources (Geological Sciences and Environmental Studies)
(2) Population Trends and World Resources (Geography)
(3) Energy Sources and Conversion (General Studies/Professional Education)
(4) Management of Energy Resources and Their Uses in the U.S. (Management)

STATE UNIVERSITY OF NEW YORK COLLEGE AT BUFFALO

Energy Science Program
Established September 1979

Contact:
Abdul H. Raoof, Professor of Political Science
State University of New York College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14221
(716) 878-5019

Type of Program: Formal interdisciplinary program that is a minor involving the Natural Sciences, Social Sciences, and Industrial Technology Departments

Degrees/Diplomas/Certificates: B.A., B.S. levels

Description/Objectives: This program is designed to provide a general education concerning energy as well as to provide liberal arts students with some training in the energy industry.

Representative Courses: Required courses are:
(1) Politics of Energy (Political Science)
(2) Economics of Energy and Environment (Economics)
(3) Physics of Energy and Environment (Physics)
(4) Nuclear Energy (Chemistry)
(5) Geology of Energy (Geological Science)
(6) Geography of Energy Resources (Geography)

STATE UNIVERSITY OF NEW YORK COLLEGE AT OSWEGO

Energy-Related Courses

Contact:
Vernon A. Tyron, Chairman
Department of Industrial Arts and Technology
State University of New York College at Oswego
Oswego, New York 13126
(315) 341-3011

Type of Program: Informal program consisting of energy-related courses offered within the Department of Industrial Arts and Technology

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives: This informal program places emphasis on laboratory activities in order to help students in understanding energy concepts.

Representative Courses:
(1) Energy Technology (Industrial Arts)
(2) Residential Energy Technology (Industrial Arts, Earth Science, Physics)

Enrollment: 65

Faculty: 5 PT

Related Activities: Energy workshop primarily for public school Industrial Arts teachers is also conducted.

STATE UNIVERSITY OF NEW YORK COLLEGE AT PLATTSBURGH

Institute for Man and His Environment

Contact:
James Dawson
State University of New York College at Plattsburgh
Hudson Hall
Plattsburgh, New York 12901
(518) 569-2178

Type of Program: Formal interdisciplinary program that is a specialization within the Environmental Science Department

Description/Objectives: This program, which mainly involves the Departments of Geology and Environmental Science, is offered as part of the program for majors studying environmental science. Solar energy and conservation are just two of the topics covered.

Representative Courses: Required courses are:
(1) Appropriate Energy Technology (Environmental Science)
(2) Solar Energy Technology (Environmental Science)
Other course:
(1) Energy Resources and Conservation (Geology)

Enrollment: 70

Research: Physics; Environmental Science; and Earth Science

Research Funding: University Research Office

STATE UNIVERSITY OF NEW YORK COLLEGE AT POTSDAM

Energy-Related Courses

Contact:
Faye Simmons
State University of New York College at Potsdam
Pierrepont Avenue
Potsdam, New York 13676
(315) 268-2700

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: These energy-related courses involve the Departments of Geology and Geography. Topics of study include environmental issues, resources, and conservation.

Representative Courses: Required courses are:
(1) Physical Geology (Geology)
(2) Resource Use and Conservation (Geography)
Other course:
(1) Geology-Environment, Man (Geology)

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

1. Energy Management Training Program
2. Institute for Energy Research
Established 1979

Contact:
Antoinette Bosco, Campus Relations Director
State University of New York at Stony Brook
Stony Brook, New York 11794
(516) 246-3580

Type of Program:
1. Formal program consisting of a twelve-week intensive course
2. Formal research program which is organized as an Institute

Description/Objectives:
1. This program is designed to help representatives from the developing areas develop effective national energy plans for their countries. It is specifically aimed at the needs of developing countries, with a list of participants including representatives from Bangladesh, Egypt, Jordan, Peru, Thailand, the Sudan, and fifteen other African, Central, and South American countries. The program was co-planned and organized by the University's Institute for Energy Research and the Energy Policy Analysis Division of Brookhaven National Laboratory's National Center for the Analysis of Energy Systems.
2. See Research (below)

External Funding: U.S. Agency for International Development

Research: (1) Research in collaboration with scientists from the Soviet Union includes: (a) the long-term effects on climate of the by-products of burning fossil fuels for energy, a study concerned with how carbon dioxide released from burning fossil fuels may alter the earth's climate; and (b) how to pump liquids in such a way that they travel through a pipe with less resistance, thereby using less energy. (2) The Energy Technology Laboratory is currently conducting cost-benefit analyses of energy conservation materials, equipment, and technologies. (3) The Institute for Energy Research explores new areas of energy policy and related research and has helped design, with Brookhaven National Laboratory, a computerized energy information system used by New York State Energy Office.

Research Funding: National Science Foundation; NASA; Oak Ridge National Laboratory; Brookhaven National Laboratory; and the Oil Heat Institute of Long Island.

Related Activities: The Solar Energy Research Workshop, which includes topics such as solar power, instruction in new techniques, wind power, new methods of growing plants without soil, and socioeconomic aspects of demand, is also conducted. It is open to the community, and students may arrange to receive college credit.

SUFFOLK COUNTY COMMUNITY COLLEGE

Energy-Related Courses

Contact:
John J. Saal, Academic Vice President
Suffolk County Community College
533 College Road
Selden, New York 11784
(516) 233-5174

Type of Program: Informal program consisting of continuing education energy-related courses

Description/Objectives: These courses, offered through the Department of Continuing Education, cover a variety of topics including the energy crisis; the effects of new resources and technologies; potential dangers of the increased production of oil, shale, coal, and nuclear energy; energy conservation techniques; and the basic elements of solar heating systems.

Representative Courses:
(1) Understanding the Energy Crisis
(2) Energy Conservation for the Homeowner
(3) Solar Heating

TOMPKINS CORTLAND COMMUNITY COLLEGE

Energy-Related Courses

Contact:
Charles E. Bechtold, Division Head
Engineering Technology and Sciences
Tompkins Cortland Community College
Dryden, New York 13071
(607) 844-8211, x374

Type of Program: Informal program consisting of continuing education energy-related courses

Description/Objectives: Through the Office of Lifelong Learning, these non-credit courses are offered to the community. A variety of topics such as solar energy and energy conservation are covered.

Representative Courses:
(1) Wood-Burning Technology
(2) Beyond Home Insulation
(3) Solar Energy and Energy Conservation
(4) Home Use of the Sun's Energy

UNITED STATES MILITARY ACADEMY

Energy-Related Courses

Contact:
William R. Calhoun, Jr., Assistant to the Dean
Office of the Dean
United States Military Academy
West Point, New York 10996
(914) 938-3122

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Degrees/Diplomas/Certificates: Bachelor's level

Description/Objectives: These energy-related courses are offered as electives by the Departments of Social Sciences, Physics and Geography, and Computer Science. Students specializing in the National Security and Public Affairs Interdisciplinary Field are able to take all of the energy-related electives.

Representative Courses:
(1) Issues of Energy, Ecology and Economy (Social Sciences)
(2) Physics of the Energy Crisis (Physics)
(3) Issues Confronting Man and His Environment (Geography and Computer Science)
(4) Conservation of Natural Resources (Geography and Computer Science)
(5) Seminar in Geography: Geographical Perspectives of World Resources (Geography and Computer Science)

Faculty: 1 FT, 3 PT

Student Assistance: All students are on scholarship and may compete for graduate scholarships and fellowships

Research: Assisting in the formulation of energy policy for the Department of Energy and research into Soviet energy policy

Research Funding: Government agencies; Army Research Office; Command Budget; and U.S. Military Academy Alumni Association

APPALACHIAN STATE UNIVERSITY

1. Engineering Electronics
2. Energy Studies
1. *Established Spring 1979*
2. *Now in effect—to be formalized Spring 1981*

Contact:
Thomas L. Rokoske, Associate Professor, Department of Physics
Appalachian State University
Boone, North Carolina 28608
(704) 262-3091

Type of Program: Formal programs which consist of concentrations within the Physics Department

Degrees/Diplomas/Certificates: B.S.

Description/Objectives:
1. Engineering Electronics is designed to meet high-technology energy needs mainly in computer-controlled energy management.
2. Energy Studies is designed for medium- and low-technology industry and services, such as energy conservation by energy audits, passive and active solar energy, hydraulic and wind electrical energy generation. The primary goal of Energy Studies is to meet the needs of students planning to pursue careers in energy-related industries and services.

Representative Courses: Required courses in Physics are:
(1) Microprocessors
(2) Advanced Microprocessors
(3) Solar Energy for Homes
(4) Alternate Energy Sources
Other courses:
(1) Energy for the 80's
(2) Nuclear Energy: Hazards vs. Benefits

Enrollment: 19

Faculty: 7

Student Assistance: Undergraduate and graduate work study in the development of an Energy Management Center, and internships

Annual Budget: $13,335

Research: The design and construction of an on-campus Energy Management Center; the evaluation of a Solar Energy Water Heating System on campus

Research Funding: University

Related Activities: During the summers of 1979 and 1980 the U.S. Department of Energy, in cooperation with University faculty, sponsored a training course entitled, "Improvement for High School Teachers: Energy Conservation and Future Energy Sources."

APPALACHIAN STATE UNIVERSITY—continued

3. Energy Concentration within the Earth Studies Program
Established Winter 1978

Contact:
Arthur N. Alderman, Director
Earth Studies Program
Appalachian State University
Boone, North Carolina 28607
(704) 262-2176

Type of Program: Formal program consisting of a major focus within the interdisciplinary Earth Studies Program, including courses from the areas of Physics, Chemistry, Business, Biology, Geology, Geography, and Philosophy

Degrees/Diplomas/Certificates: B.A. level

Description/Objectives: This program strives to encourage energy self-sufficiency and ecoconscious living in the community. Two of the six major concerns of the program are (1) Renewable Energy Sources—Both direct and indirect forms of solar energy are used in the program. Energy sources considered to have good potential for the Appalachian region include small scale hydro, wind power, solar for space and water heating, wood, alcohol, and methane; and (2) Shelter—The focus here is on designing structures suitable to the Appalachian region using the energy resources of the region. Passive solar features can be combined with local renewable energy resources in order to create energy independent dwellings. The program consists of classes, skill workshops, and demonstrations, all of which are geared toward teaching self-sufficiency, and ecologically sound, regionally adapted technologies.

Representative Courses:
(1) Man, Energy and Society
(2) Internship in Alcohol Fuel
(3) Internship in Solar Construction
(4) The Politics of Energy
(5) Passive Solar Design
(6) Internship in Wind Energy

Enrollment: 206

Faculty: 1 FT, 8 PT

Student Assistance: Work study; barter system of skills and labor for room, board and fees.

Annual Budget: $124,643

External Funding: U.S. Department of Energy; Appalachian Regional Commission

Research: Homestead Wind Energy; Passive Solar Design and Construction; Solar Water Systems; and Alcohol Fuels.

Related Activities: Workshops for extension or college credit such as Alcohol Fuel Production and Wind Energy are conducted. Technical assistance and consultation is also offered.

CALDWELL COMMUNITY COLLEGE AND TECHNICAL INSTITUTE

Energy-Related Courses

Contact:
Dick William, Coordinator of Occupational Education
Caldwell Community College and Technical Institute
P.O. Box 600
Lenoir, North Carolina 28645
(704) 728-4323

Type of Program: Informal program consisting of continuing education energy-related courses

Description/Objectives: Energy Awareness courses are given through the Department of Continuing Education and cover a variety of energy-related topics.

COASTAL CAROLINA COMMUNITY COLLEGE

Energy and The Way We Live

Established November 1979

Contact:
Fred R. Smith, Jr.
Coastal Carolina Community College
444 Western Boulevard
Jacksonville, North Carolina 28540
(919) 455-1221

Type of Program: Informal, interdisciplinary program involving the areas of Physics and the Humanities

Description/Objectives: This program consists of a bi-monthly presentation and discussion of relevant energy issues. The goal is to inform and stimulate citizens to become involved in decisions concerning energy use. These seminars are free and open to the public.

External Funding: National Endowment for the Humanities

MARS HILL COLLEGE
Energy-Related Seminar

Contact:
Mars Hill College
Mars Hill, North Carolina 28754
(704) 689-1111

Type of Program: Informal seminar at the community level

Description/Objectives: This four-hour, energy-related seminar is offered twice on Saturdays and is open to the community.

Representative Course: Hydro-Electric Power for Your Home

MARTIN COMMUNITY COLLEGE

Energy Conservation and Alternate Energy Sources Workshop

Established Summer 1980

Contact:
Geoffrey Balkam, Program Director
Energy Conservation and Alternate Energy Sources
Martin Community College
Kehukee Park Road
Williamston, North Carolina 27892
(919) 792-1521

Type of Program: Formal program consisting of a two-week summer workshop for teachers

Description/Objectives: This program is designed to cover the following areas: (1) the history of energy use in the United States and its effect upon the world picture; (2) technical information; (3) energy problems facing the United States today; (4) solutions; (5) the impact of the energy crisis on society. The primary objective of this workshop is to teach participating teachers in the sciences and humanities prevalent energy conservation methods and alternate energy sources so that they may inform their own students of these measures.

Student Enrollment: 30

Annual Budget: $15,349

External Funding: U.S. Department of Energy

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

Energy-Related Courses

Contact:
Carl F. Zorowski, Associate Dean
North Carolina State University
239 Riddick
Raleigh, North Carolina 27650
(919) 737-2011

Type of Program: Informal interdepartmental program consisting of energy-related courses within existing degree programs

Degrees/Diplomas/Certificates: Bachelor's, Master's, and Doctoral levels

Description/Objectives: Energy education is a significant part of each of the following degree programs:
(1) Architecture (Undergraduate and Graduate)
(2) Biological and Agricultural Engineering (Undergraduate and Graduate)
(3) Chemical Engineering (Undergraduate and Graduate)
(4) Civil Engineering (Undergraduate and Graduate)
(5) Conservation (Undergraduate)
(6) Forestry (Undergraduate and Graduate)
(7) Geology (Undergraduate and Graduate)
(8) Technology for International Development (Graduate)
(9) Marine Science and Engineering (Graduate)
(10) Materials Engineering (Undergraduate and Graduate)
(11) Mechanical Engineering (Undergraduate and Graduate)
(12) Nuclear Engineering (Undergraduate and Graduate)
(13) Public Policy Concentration in Political Science (Undergraduate)
(14) Wood and Paper Science (Undergraduate and Graduate)

Representative Courses:
(1) Renewable Resources Management (Forestry)
(2) Energy Sources, Uses and Conservation (Mechanical and Aerospace Engineering)
(3) Energy Conservation in Industry (Mechanical and Aerospace Engineering)
(4) Applications of Nuclear Engineering (Nuclear Engineering)
(5) Conservation of Natural Resources (Zoology)

External Funding: North Carolina Department of Instruction; Energy Division of North Carolina Department of Commerce; U.S. Department of Energy; Southern Solar Energy Center, Atlanta; Solar Energy Research Institute, Colorado; National Endowment for the Arts Program for Schools, Hospitals, Local Governments and Public Care Institutions

continued

Research: Department of Chemical Engineering—research in coal gasification; Department of Electrical Engineering—solar cell research; Department of Mechanical and Aerospace Engineering—solar energy research

Related Activities: Off-campus conferences, workshops, seminars and short courses include: two-day seminar in Thermal Energy Storage for Heating and Cooling; two-day Science Educators' Conference on Energy Conservation; two-day workshop on Wood Fuel for Small Industrial Energy Users; and three-day course to qualify technical assistance analysts for performing energy conservation audits in the State of North Carolina. For further information contact: Dr. R. A. Mabry, Director, Continuing Education, 147 McKimmon Center, North Carolina State University, Raleigh, North Carolina 27650.

PIEDMONT TECHNICAL COLLEGE

Energy Technology Program

Established Fall 1981 (Proposed)

Contact:
Thomas E. Carden, Director, Industrial Technology
Piedmont Technical College
Memorial Drive
P.O. Box 1197
Roxboro, North Carolina 27573
(919) 599-1181

Type of Program: Formal three year energy-related technology program

Degrees/Diplomas/Certificates: A.A.S.

Description/Objectives: The chief purpose of this program will be to train students in the many aspects of energy production and use with emphasis on innovation, efficiency, conservation, and environmental impact. Among the instructional areas being included in the program are: (1) the installation, operation, and maintenance of steam and other systems for electric power generation. Steam systems will use a variety of fuels such as coal, oil, natural gas, emerging "new" fuels such as wood pellets and methane gas, fuel handling methods (including fluidized base coal), and system conversion methods designed to utilize more plentiful and less costly fuels on a more efficient basis; (2) the installation, operation and maintenance of commercial and residential heating and cooling systems and electrical generators using steam and hot water from the above sources, hot water from solar panels or electricity, and possible interconnection of different types of systems; (3) the installation, operation, and maintenance of instrumentation controls and valves, pumps, and other components for the systems noted above. The program will also be set up to serve as a demonstration center of efficient fuel usage and system conversion by experimentation with new technologies as they become available. The program will serve as a center for collecting, storing, and disseminating energy conservation and technology information.

External Funding: State funds

SOUTHWESTERN TECHNICAL COLLEGE

Solar Mechanics Curriculum

Established 1978

Contact:
Glenn Liming, Curriculum Head
Southwestern Technical College
P.O. Box 67
Sylva, North Carolina 28779
(704) 586-4091

Type of Program: Formal, autonomous program

Degrees/Diplomas/Certificates: Diploma upon completion

Description/Objectives: The Solar Mechanics curriculum prepares students to install and maintain solar energy systems. Courses provide a broad background of skills which will enable the solar mechanic to adapt to changing conditions. Actual construction projects are combined with classes and labs to provide as much practical experience as possible.

Representative Courses:
(1) Economics of Solar Energy Systems
(2) Solar-Electric Systems
(3) Residential Energy Conservation
(4) Energy Perspectives

Student Enrollment: 15

Faculty: 1 FT, 1 PT

Student Assistance: Work-Study, and scholarships

Related Activities: Energy-related adult education and professional training courses are also conducted.

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

1. North Carolina Piedmont Crescent Energy Project
2. Energy-Related University Course
3. Energy-Related Correspondence Course

Established
1. *1977–78*

Contact:
1. Joe W. Straley, Director, Room 278, Phillips Hall 039A
2. Russell F. Christman, Environmental Sciences and Engineering, School of Public Health
3. Independent Study by Extension, 121 Abernathy Hall 002A

University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27514
1. (919) 933-3010
2. (919) 966-1171
3. (919) 933-1365

Type of Program:
1. Informal program consisting of energy research
2. Informal program consisting of an energy-related course offered through the Department of Environmental Sciences and Engineering
3. Informal program consisting of an energy-related independent study course offered through Extension

Description/Objectives:
1. Goals of the North Carolina Piedmont Crescent Energy Project include an increased awareness for those involved in decision making regarding energy use of how their decisions interrelate with those in other areas; identification of related research needs in areas that are beyond this particular study and bringing those needs to the forefront; and the development of a methodology for dealing with energy/resource data at the county level.
2. The Energy and Man's Environment course covers a variety of energy-related topics.
3. Energy and Man is an independent study course on energy. The primary goal of this course is to have students understand basic energy terminology, units and laws; present and projected energy sources and usage patterns; the global nature of energy problems and their international implications; the environmental impact; and the need for personal and societal energy conservation. Course topics include nuclear and geothermal energy as well as various other energy-related subjects.

Faculty:
1. 3 FT, 1 PT

Annual Budget:
1. $100,000

continued

External Funding:
1. Federal Government; State Government; various foundations
3. North Carolina Department of Commerce

Research:
1. The North Carolina Piedmont Crescent Energy Project is developing a methodology for dealing with energy/resource data at the county level and the application of this methodology to each of the counties in the Piedmont Crescent.

Research Funding: U.N.C. at Chapel Hill; Institute for Environmental Studies at U.N.C. at Chapel Hill; Mary Reynolds Babcock Foundation; Title I, National Education Act of 1965 (Proj. 78-002-005)

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

Energy-Related Engineering Programs

Established 1973

Contact:
R. D. Snyder, Dean, College of Engineering
University of North Carolina at Charlotte
UNCC Station
Charlotte, North Carolina 28223
(704) 597-2301

Type of Program: Formal energy-related degree programs in engineering

Degrees/Diplomas/Certificates: Bachelor of Science in Engineering with a major in Engineering Science; Bachelor of Engineering Technology with a major in Mechanical Engineering Technology

Description/Objectives: These programs offer students an opportunity to study energy-related topics concerning methods of energy conversion, heating and air conditioning systems, and nuclear reactors.

Faculty: 5 FT, 2 PT

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE—continued

2. Architectural Education and Energy

Contact:
Charles C. Hight, Dean, College of Engineering
University of North Carolina at Charlotte
UNCC Station
Charlotte, North Carolina 28223
(704) 597-2357

Type of Program: Formal program with an emphasis in architecture

Degrees/Diplomas/Certificates: Bachelor of Arts in Architecture; Bachelor of Architecture

Description/Objectives: The primary emphasis in this focus is placed upon passive energy design. Several students and faculty have been involved with active solar energy design studies. In addition, passive energy studies are integrated into almost all the design studios, with special emphasis during the first two years, so that students develop the habit of being "energy conscious" in their design activities. Since architectural students have one studio each semester, the influence is substantial. Similarly, a number of lecture/seminar courses are offered which study energy phenomena in greater detail, particularly technical matters and their relationships to both material selection and form determination.

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

Energy-Related Courses

Contact:
Herbert Wells, Assistant Vice Chancellor for Academic Affairs
University of North Carolina at Greensboro
Greensboro, North Carolina 27412
(919) 379-5000

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Description/Objectives: These course offerings involve the Departments of Physics and Interior Design and touch on many energy-related topics.

Representative Courses:
(1) Energy Options and the Environment (Physics)
(2) Interior Architecture (Interior Design)

NORTH DAKOTA STATE SCHOOL OF SCIENCE

Alcohol Fuel Education Training and Communication Program

Established February 1980

Contact:
Sam Schimelfenig, Dean, Technical Division
North Dakota State School of Science
Wahpeton, North Dakota 58075
(701) 671-2244

Type of Program: Formal training and assistance program organized as a Center

Description/Objectives: This program is designed to educate farmers and others in the production and use of alcohol fuels. Organized as a Center, the program also provides technical assistance and consumer protection information. The main objective of this program is to assist farmers in determining whether alcohol production on the farm is feasible.

External Funding: U.S. Department of Energy

BOWLING GREEN STATE UNIVERSITY

Northwest Ohio Community Energy Policy Project
Established May 1979

Contact:
Thomas Coff, Physics Department
Delmer Hilyard, Speech Communications Department
Bowling Green State University
Bowling Green, Ohio 43403
(419) 372-0489

Type of Program: Formal program consisting of a series of community service and continuing education, energy-related workshops

Description/Objectives: These workshops bring together citizens for the purpose of developing locally focused energy policy statements and recommendations to be disseminated and implemented in various communities. Participants, representative of citizens in the locale and drawn from diverse groups, receive resource packets outlining the process of the workshop and data compiled on their local community. During the workshops, participants actively engage in group interactive experiences designed to identify local problems resulting from energy scarcities and cost increases and to develop and test four or five energy policies feasible for implementation. The consequences of each policy are analyzed in small discussion groups through the use of a "cross impact matrix," a table of numbers representing interactions between defined lifestyle factors and citizen-recommended energy policies. Each of the workshops has resulted in a set of policy options to be considered by local communities. Proposed policies include promoting and stimulating the use of regional mass transit, the establishment of a public corporation to develop alternate energy sources within the county, and the support of increased education related to energy.

Student Enrollment: 120

Number of Faculty: 3 PT

External Funding: U.S. Department of Education

CASE-WESTERN RESERVE UNIVERSITY

1. Energy-Related Options
2. Energy Research Office

Contact:
Osman K. Mawardi, Director, Energy Research Office
Case-Western Reserve University
Cleveland, Ohio 44106
(216) 368-4570

Type of Program:
1. Formal programs consisting of undergraduate and graduate energy-related options offered by the various science and engineering departments
2. Energy Research Office

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives:
1. The goal of these options is to train students at the undergraduate and graduate levels in the field of energy. Specialized courses are given in nuclear technology and power plant design. Energy management and conservation courses are offered at the graduate level.
2. The Energy Research Office was formed to coordinate the extensive amount of ongoing research on energy, as well as to improve communication between the various academic departments and to encourage joint university-industry programs on energy.

External Funding: U.S. Department of Energy; National Science Foundation; Department of Defense; State of Ohio; and private foundations

Research: The university has also played a major role in the formation of an Ohio multiuniversity research corporation for coal (Ohio Coal Research Laboratory Association).

Research Funding: The National Conference on Energy Auditing and Conservation, which took place on-campus, was a two-day seminar. People from all over the country attended to evaluate their own energy problems based on information from fourteen experts in government, industry, and higher education. The principal sources of funding for this conference were the Association for Media-based Continuing Education for Engineers (AMCEE), and contributions by faculty and staff.

CLARK TECHNICAL COLLEGE

Energy Management Technology

Contact:
A. E. Hartman
Clark Technical College
Box 570
Springfield, Ohio 45504
(513) 325-0691

Type of Program: Formal program which is a specialization within the Department of Engineering

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This specialization is designed to prepare students in the field of energy management technology with special emphasis on conservation. Areas such as solar and wind energy are also included.

Representative Courses: Required courses are:
(1) Heat Transfer
(2) Air Flow Systems
(3) Energy Conservation
(4) Non-Conventional Energy

Enrollment: 6

Faculty: 1 PT

Related Activities: Energy-related community activities as well as adult and consumer education are also conducted.

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LAKELAND COMMUNITY COLLEGE

Energy-Related Courses

Contact:
Lynn Russell, Coordinator, Life Long Learning
Lakeland Community College
Mentor, Ohio 44060
(216) 953-7081

Type of Program: Informal program consisting of energy-courses offered through the Center for Life Long Learning

Degrees/Diplomas/Certificates: Certificate

Description/Objectives: These energy-related courses focus primarily on conservation and solar energy.

Representative Courses:
(1) Energy Use Management (In cooperation with American Metals Society for Industry)
(2) Energy (In cooperation with Builders Group)
(3) Solar Energy and Man
(4) Solar Energy
(5) Solar Design

Faculty: 3 PT

Related Activities: Kollege for Kids—Experimenting with Solar Energy is also conducted (summer only).

MIAMI UNIVERSITY

Energy Concentration
Established 1976

Contact:
Gene E. Willeke, Director, Institute of Environmental Sciences
Miami University
Oxford, Ohio 45056
(513) 529-5811

Type of Program: Formal interdisciplinary graduate program which is a concentration within the Master of Environmental Science Program and involves the Departments of Physics, Chemistry, Economics, Geology, Geography, Political Science, and Architecture

Degrees/Diplomas/Certificates: M.En.

Description/Objectives: This area of concentration is intended to provide a basic understanding of the social, political, and environmental problems of energy production. Within this concentration energy management and conservation are two primary areas of emphasis.

Representative Courses: Required courses are:
(1) Environmental Physics (Physics)
(2) Geography of Energy Resources (Geography)
(3) Physical Chemistry (Chemistry)
(4) Public Utilities (Economics)
Other courses are:
(1) Proseminar on Public Policy Analysis (Political Science)
(2) Chemical Thermodynamics (Chemistry)
(3) Petroleum Geology (Geology)
(4) Physics of Nuclear Energy (Physics)

Enrollment: 5

Faculty: 10 PT

Student Assistance: Six-month internships with Oak Ridge National Laboratory, Argonne National Laboratory, Batelle, Ohio Department of Energy, City of Middletown, and City of Richmond

Research: Conservation; peak load reduction; solar; biomass; coal characterization; and socioeconomic aspects

Research Funding: Ohio Interuniversity Research Council; U.S. Department of Energy; Ohio Coal Research Laboratories Association

Related Activities: Under a U.S. Office of Environmental Education grant an eight-part instructional television series on Energy and Environment was developed. Energy-related adult education, extension courses, and outreach programs are also conducted.

MUSKINGUM AREA TECHNICAL COLLEGE

Petroleum Engineering Technology Program
Established Fall 1975

Contact:
Dan Durfee, Instructor
Muskingum Area Technical College
1555 Newark Road
Zanesville, Ohio 43701
(614) 454-2501

Type of Program: Formal program organized as an autonomous department

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: The major goal of this two-year program is to train students as entry-level petroleum engineering technicians.

Representative Courses: Required courses are:
(1) Introduction to Petroleum Technology
(2) Rig Construction and Drilling Operations
(3) Oil Field Services
(4) Petroleum Geology
(5) Oil and Gas Well Completions

Enrollment: 50

Faculty: 1 FT

Annual Budget: $22,906

Related Activities: Energy-related adult and consumer education is also conducted.

NORTH CENTRAL TECHNICAL COLLEGE AND OHIO STATE UNIVERSITY AT MANSFIELD

1. Energy-Related Courses
2. Energy Alternatives
Established Spring 1980

Contact:
Donovan L. Clark, Coordinator
Community Educational Services
North Central Technical College and Ohio State University at Mansfield
1680 University Drive
Mansfield, Ohio 44906
(419) 755-4289

Type of Program:
1. Informal program consisting of energy-related courses
2. Formal joint community education program consisting of short courses

Description/Objectives:
1. These for-credit courses cover a variety of solar energy-related topics.
2. The purpose of these short noncredit courses is to increase community awareness of energy alternatives. Courses deal with solar and wind energy. The attainment of the necessary skills in the reading, interpretation, and drawing of building plans and electrical schematic and wiring diagrams is another goal of the program.

Representative Courses:
1. For-credit courses:
(1) Basic Processes for Solar Energy
(2) Fundamentals of Solar Energy
2. Non-credit courses:
(1) Solar and Underground Homes
(2) Estimating Energy Efficiency
(3) Wind Energy

Enrollment: 108

Faculty: 2 PT

Student Assistance: Fees are waived for Ohio residents (one year residence required) who are sixty years of age or older, as space permits.

OBERLIN COLLEGE

1. Energy Technology Course
2. Energy-Related Public Lectures
Established February 1981

Contact:
Terry S. Carlton
Chemistry Department
Oberlin College
Oberlin, Ohio 44074
(216) 775-8300

Type of Program: Informal program consisting of an energy-related course and a public lecture series.

Description/Objectives:
1. The purpose of Energy Technology is to help acquaint students with the facts surrounding the energy issues in order that they may intelligently evaluate them.
2. The public lecture series examines a wide variety of energy-related matters.

Representative Courses:
1. Formal Course:
Energy Technology (Chemistry and Physics)
2. Informal Lectures:
(1) Humankind Tomorrow III: Energy—An Issue of Survival (Series of nineteen public lectures)
(2) Nuclear Power: Is It Needed? Is It Safe? (Series of 4 public lectures)

Faculty: 2 PT

UNIVERSITY OF CINCINNATI

Energy Management/Auditing Technology Program
Established September 1978

Contact:
Terry A. Thompson, Director
Energy Management/Auditing Technology Program
University of Cincinnati
Cincinnati, Ohio 45221
(513) 475-6428

Type of Program: Formal degree program offered by the Business and Commerce Department of the school's University College.

Degrees/Diplomas/Certificates: A.A.S.; Certificate of Achievement in Energy Management

Description/Objectives: This two-year program is designed to develop energy technicians who will be skilled in: (1) measuring energy consumption and distribution in institutional, commercial, and industrial facilities; (2) assisting in the design of energy-efficient mechanical and electrical systems for the above facilities; (3) producing accurate and attractive engineering drawings; and (4) implementing detailed energy audit procedures.

Representative Courses:
(1) Energy Resource Technology
(2) Energy Systems Review
(3) Principles of Management

Enrollment: 57

Annual Budget: $24,948

OKLAHOMA STATE UNIVERSITY

Energy Awareness Work Conference for Educators
Established 1976

Contact:
Kenneth Wiggins, Director
Oklahoma State University
208 Poultry Science
Stillwater, Oklahoma 74078
(405) 624-7015

Type of Program: Formal program consisting of an annual three-week summer conference

Degrees/Diplomas/Certificates: Certificate of Completion from the Oklahoma Department of Energy

Description/Objectives: This program brings together public school educators and administrators in Oklahoma from grades K-12 with officials from energy-producing industries and governmental institutions. The three-week summer conference spends half its time on curricular matters and materials, with the other half devoted to talks with industry and government officials, as well as on-site visits to energy producing locations in Oklahoma. The goals are: (1) to encourage close affiliation between educational institutions, energy-producing industries, and government agencies; (2) to train teachers and administrators in the application of energy education; (3) to make energy education materials available to students in all grades; and (4) to develop new in-service energy education curriculum materials. Graduate credit is available to teachers completing the program.

Enrollment: 40

Faculty: 3

Annual Budget: $25,000

External Funding: Energy-producing industries

Related Activities: A thirty-minute educational and training film outlining the energy problems facing the nation and their possible solutions through research and conservation was made and distributed by the University.

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UNIVERSITY OF TULSA

National Law and Policy Institute

Contact:
Judith Franks, Assistant Vice President for Academic Affairs
University of Tulsa
600 South College
Tulsa, Oklahoma 74104
(918) 939-6351

Type of Program: Formal program organized as a research institute in the College of Law

Description/Objectives: The Institute offers conferences and short courses focusing on energy law policy and public questions regarding energy issues.

LANE COMMUNITY COLLEGE

1. Energy-Management Technician Program
2. Residential Energy Analyst Program
Established Fall 1980

Contact:
Larry Murray, Director
Special Programs
Lane Community College
4000 East 30th Avenue
Eugene, Oregon 97405
(503) 747-4501

Type of Program:
1. Formal degree program; 2. Formal certificate program

Degrees/Diplomas/Certificates:
1. A.S.; 2. Certificate

Description/Objectives: Both programs emphasize the preparation of students for careers in the energy field.
1. This two-year program requires energy, math and communication skills courses. In addition, students must select elective courses from one of the following four areas: (a) drafting; (b) solar construction; (c) business; or (d) technical.
2. The certificate program is designed to train students for employment as residential analysts and in the installation and marketing of weatherization products.

Representative Courses:
1. Courses in the Energy Management Technician Program are:
(1) Energy in Society
(2) Energy Technology/Essentials of Physics
(3) Solar Fundamentals
(4) Electric Power and Illuminating Systems
(5) Alternate Energy Resources
(6) Energy Planning and Management
(7) Solar Design and Sizing Systems
(8) Solar Collectors and Storage
(9) Alcohol Fuel Production
2. Courses in the Residential Energy Analyst Program are:
(1) Energy Technology
(2) Energy in Society
(3) Weatherization Products
(4) Residential Energy Use Analysis
(5) Solar Fundamentals

External Funding: U.S. Department of Education—$20,000; U.S. Department of Energy—$7,500

Related Activities: Energy-related consumer and adult education activities are also conducted.

OREGON STATE UNIVERSITY

1. Energy-Related Courses
2. Energy Extension Program
Established
2. *January 1980*

Contact:
Owen D. Osborne, Energy Program Leader
Extension Service
Oregon State University
114 Dearborn Hall
Corvallis, Oregon 97331
(503) 754-3004

Type of Program:
1. Energy-related for-credit courses
2. Formal extension program

Description/Objectives:
1. University-based energy courses are interdisciplinary and cover a wide range of topics.
2. Energy extension is part of a nationwide Energy Extension Service designed to encourage increased efficiency in the use of energy as well as the adoption of alternate energy sources. Four major elements comprise this program: (1) Builder/Contractor Program, which provides seminars, workshops, and on-site demonstrations for those individuals who influence energy conservation decisions in the housing industry; (2) Consumer Response Program, which provides a personal counseling and referral service to individuals with energy conservation questions; (3) Master Conserver Program, which provides forty hours of training in alternate energy technology to volunteers in the state's largest urban areas. Volunteers are then expected to share what they have learned with others. Topics of the program are energy policy, energy efficiency, weatherization, solar systems, wood burning, and energy conservation tax incentive programs; (4) Small Business Program, which provides seminars, workshops, and on-site counseling in energy management to small business owners in cooperation with the Oregon Department of Energy's Clearinghouse for Commerce and Industry and trade associations.

Representative Courses:
(1) Solar Radiation (Atmospheric Science)
(2) Landscape Design (Architecture)
(3) Family Housing (Economics)
(4) Household Equipment (Home Economics)
(5) Mechanical Analysis and Design
(6) Heating and Air Conditioning
(7) Automotive Engineering

continued

Enrollment: 250

External Funding: U.S. Department of Energy—$350,000

Research: Research topics include solar energy utilization in agriculture, fluidized bed combustion of coal, low-head hydroelectric, combustion mechanics of wood residue fuels, wind energy resources and utilization, geothermal resources and utilization, and alcohol production from biomass materials.

Research Funding: U.S. Department of Energy; and corporations.

UNIVERSITY OF OREGON

1. Energy-Related Courses
2. Energy Production and Use in the Pacific Northwest Workshop
Established
2. *June 1980*

Contact:
David R. Sokoloff, Associate Professor of Physics
Allan Hughes, Research Associate, Department of Physics
Department of Physics
University of Oregon
Eugene, Oregon 97403
(503) 686-4751

Type of Program:
1. Informal program consisting of energy-related courses offered within the Department of Physics
2. Formal program consisting of a summer workshop

Description/Objectives:
1. These energy-related courses offered through the Department of Physics cover a variety of relevant topics.
2. This three-week seminar is designed for middle school teachers and offers graduate credit upon successful completion. The program's objectives are to increase teachers' knowledge of basic scientific principles needed to understand the energy picture in the United States and possible alternative solutions to energy problems as well as to provide materials for the introduction of energy topics into the middle school curriculum. The summer workshop is followed by monthly academic seminars through December.

Representative Courses:
(1) Physics of Energy and Environment
(2) Sun as a Future Energy Source

Student Enrollment:
2. 25

Student Assistance:
2. Tuition waiver and $200 stipend

Annual Budget:
2. $26,000

External Funding:
2. U.S. Department of Energy—$23,500; Eugene Water and Electric Board—$2,500

Research: Research includes a solar energy monitoring program and solar collector studies.

Research Funding: Bonneville Power Administration and the Eugene Water and Electric Board

INDIANA UNIVERSITY OF PENNSYLVANIA

Solar Energy Course
Established 1977

Contact:
R.E. Hershman
Department of Physics
Indiana University of Pennsylvania
Indiana, Pennsylvania 15705
(412) 357-2192

Type of Program: Informal program consisting of one energy-related course

Description/Objectives: The Department of Physics offers this course on solar energy.

Representative Course: Solar Energy (Physics)

MUHLENBERG COLLEGE

Energy-Related Courses

Contact:
Charles S. Bednar
Political Science Department
Muhlenberg College
Allentown, Pennsylvania 18104
(215) 433-3191

Type of Program: Informal interdisciplinary program consisting of energy-related courses

Degrees/Diplomas/Certificates: B.A., B.S. levels

Description/Objectives: These energy-related courses involve the Departments of Physics, Chemistry, Biology, and Political Science. The Problems in Science and Society course examines the interplay of science and technology as it relates to social needs, public policy and man's survival. Topics may include energy resources, environmental contamination, population pressures, and exploitation of our lands and oceans. The Post-Abundant Society course provides an approach to many problems, including planetary energy and resources and examines the history of growth and technology in the United States; the socioeconomic aspects of contemporary post-industrial Western societies; and the ecology, politics, and economics of resource scarcity.

Representative Courses:
(1) Problems in Science and Society (Chemistry)
(2) Problems in Science and Society (Physics)
(3) Problems in Science and Society (Biology)
(4) The Post-Abundant Society

Enrollment: 35

Faculty: 3 FT

Student Assistance: Internship with local and state government

External Funding: Mellon Foundation—$45,000

PENNSYLVANIA STATE UNIVERSITY

Student Involvement/Community Energy Program
Established 1977

Contact:
Frederick Fisher, Project Director
Department of Community Development
Pennsylvania State University
University Park, Pennsylvania 16802
(814) 863-2207

Type of Program: Formal program consisting of community service and outreach by students as part of undergraduate and graduate degree programs

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives: This program enables students to earn credit toward their degrees by undertaking specific energy-related community service practicums in various parts of Pennsylvania. Students are closely supervised by faculty members, and work in a variety of capacities. For example, students helped one borough develop an overall energy plan; surveyed a county government's energy program policies; wrote a special insert in a county newspaper on energy; and developed a hands-on workshop to teach local homeowners how to build solar hot water heaters. The mechanism by which these activities are accomplished is the Community Consultation Laboratory. Students from the following fields of study have participated in the program: mineral processing, regional planning, health planning and administration, community systems planning and development, and parks and recreation.

Enrollment: 10 FT, 115 PT

Faculty: 7 PT

Annual Budget: $23,609

External Funding: U.S. Department of Energy, Pennsylvania Governor's Energy Council

SPRING GARDEN COLLEGE

Energy Engineering Technology Program
Established 1978

Contact:
T. Marshall, Jr., Professor
Department of Electronics, Computer and Energy Studies
Spring Garden College
102 E. Mermaid Lane
Chestnut Hill, Pennsylvania 19118
(215) 242-3700

Type of Program: Formal interdisciplinary degree granting program

Degrees/Diplomas/Certificates: A.S. and B.S. in Energy Engineering Technology

Description/Objectives: This program provides an interdisciplinary approach to educating the student in the energy engineering technology field. It includes courses in electrical, electronic and mechanical engineering technologies, as well as in physics, chemistry, mathematics, and computer programming. In addition, several new interdisciplinary courses have been added (see below) to those already offered by various departments.

Representative Courses:
(1) Introduction to Energy Technology
(2) Energy Sources
(3) Energy Management and Conservation (proposed)

Enrollment: 9

Faculty: 2

TEMPLE UNIVERSITY

1. Mechanical/Energy Engineering Technology Specialization
2. Architecture/Energy Specialization
Established 1976

Contact:
Steven M. Ridenour
College of Engineering Technology
Temple University
Broad and Montgomery Streets
Philadelphia, Pennsylvania 19122
(215) 787-7143

Type of Program:
1. Formal interdisciplinary program organized as a specialization within the Department of Mechanical Engineering Technology
2. Formal interdisciplinary program organized as a specialization within the Department of Architecture

Degrees/Diplomas/Certificates: B.S.

Description/Objectives:
1. This specialization is designed to prepare mechanical engineers to effectively deal with heat energy conversion.
2. This specialization is designed to prepare architects to effectively use solar, energy conservation, and life-cycle costing.

Representative Courses:
(1) Energy and Building Design (Architecture)
(2) Applied Energy Systems (Mechanical Engineering)

Research: Research in computer-aided energy analysis in buildings is conducted.

THIEL COLLEGE

Energy-Related Courses
Established 1974

Contact:
J. Henry Barton
Thiel College
Greenville, Pennsylvania 16125
(412) 588-7700

Type of Program: Informal program consisting of energy-related courses within the Environmental Science Program of the Department of Environmental Studies

Degrees/Diplomas/Certificates: B.A., B.S. levels

Description/Objectives: Energy-related courses make up an integral part of the Environmental Science Program. Topics include energy conservation and energy alternatives. The Applied Environmental Science class is currently involved with the development of an energy audit/conservation program for the College.

Representative Courses:
(1) Introduction to Environmental Studies
(2) Energy Conservation in the Home
(3) Applied Environmental Science

Enrollment: 50

Faculty: 1 FT, 6-10 PT

Student Assistance: Internships

Related Activities: A course similar to Energy Conservation in the Home is offered by the Center for Life Long Learning.

UNIVERSITY OF PENNSYLVANIA

Energy Management and Policy Academic Program
Established 1975

Contact:
Lawrence Eisenberg, Director
University of Pennsylvania Energy Center
3221 Walnut Street/K2
Philadelphia, Pennsylvania 19174
(215) 243-8507

Type of Program: Formal interdisciplinary graduate program administered by the university's Graduate Group on Energy Management and Policy under the School of Public and Urban Policy; the Energy Center is the research arm of the Graduate Group

Degrees/Diplomas/Certificates: M.S. and Ph.D in Energy Management and Policy; joint degrees with business, law, and engineering

Description/Objectives: The program was established to prepare the student to effectively use interdisciplinary knowledge in order to solve energy problems. The program synthesizes knowledge from the disciplines of the physical sciences, life sciences, social sciences, public policy, humanities, and professional schools of law, business, and city, and regional planning. The program: (1) provides a focal point for energy research; (2) offers elective courses designed to help the student understand the complexities of energy; (3) through class project, encourages students to use the university itself as a laboratory for research into energy conservation and energy systems design; (4) generates funds for academic and research programs on campus.

Enrollment: 32 FT, 26 PT

Faculty: 3 FT, 12 PT

Annual Budget: $107,700

External Funding: National Science Foundation, Ford Foundation, Pennsylvania Governor's Energy Council, Edison Electric Institute, other foundations, utilities, industry

Research: $224,780

Research Funding: (see above)

C 220

COMMUNITY COLLEGE OF RHODE ISLAND

Energy-Related Course

Established September 1980

Contact:
Americo Ottaviano, Dean
Community College of Rhode Island
Louisquisset Pike
Lincoln, Rhode Island 02865
(401) 333-7070

Type of Program: Informal program consisting of one solar-related course offered through the Department of Community Services

Description/Objectives: This noncredit course is designed to serve the community's need for increased information on solar energy.

Representative Course: Saving Money With Solar

Faculty: 1 PT

Research: Wind machine project

Research Funding: U.S. Department of Energy

UNIVERSITY OF RHODE ISLAND
Energy Education Resource Program

Contact:
Donald D. Kirwin and Jack Willis, Co-directors
Office of Energy Education
University of Rhode Island
Kingston, Rhode Island 02881
(401) 792-2478

Type of Program: Formal interdisciplinary program organized as a separate office under the vice president for academic affairs

Description/Objectives: This program serves as a statewide energy education resource, particularly for the state's teachers. It makes available existing energy education curricula and materials, develops new energy education curricula and materials, and offers graduate-level courses in energy areas geared especially to teachers.

Representative Courses:
(1) Physics and the Energy Crises
(2) Experiments and Demonstrations in: Solar Energy; Nuclear Science; Fluid Energy
(3) Energy Resources and Conservation

Enrollment: 75 PT

Faculty: 4 PT

Annual Budget: $60,000

External Funding: Rhode Island State Education Agency, Governor's Energy Office, National Science Foundation, U.S. Department of Energy ($5,000)

Related Activities: International conference on energy education planned for August of 1981

HORRY-GEORGETOWN TECHNICAL COLLEGE

Energy Conservation and Use Management Technology Program
Established 1979

Contact:
Wade Harper, Director
Energy Conservation and Use Management Technology Program
Horry-Georgetown Technical College
Highway 501 East
Conway, South Carolina 29526
(803) 347-3186

Type of Program: Formal two-year degree granting program

Degrees/Diplomas/Certificates: Diploma

Description/Objectives: This program is designed to provide highly skilled graduates to fill both long and short-term needs in the area of energy management, including energy-related research and development. The graduates of this program will develop the management and technical capabilities necessary to work in the fields of energy production, use, and conservation. They will have an understanding of equipment, servicing, and maintenance procedures in the area of energy management. They will be able to develop, construct, test, operate, maintain, and/or install modern energy-saving equipment in homes, businesses, factories, and other institutions. Typically, this equipment consists of combinations of mechanical, electrical, thermal, fluid, and/or optical components frequently controlled by computers or microprocessors.

Representative Courses:
(1) Fundamentals of Energy Technology
(2) Energy Production Systems
(3) Energy Conservation
(4) Energy Audits
(5) Energy Economics

Enrollment: 24 FT, 1 PT

Faculty: 1 FT, 5 PT

UNIVERSITY OF SOUTH CAROLINA

Energy-Related Course

Contact:
W.K. Humphries, Associate Dean
College of Engineering
University of South Carolina
Columbia, South Carolina 29208
(803) 777-4177

Type of Program: Informal program consisting of one solar-related course

Description/Objectives: This course, offered through the Department of Mechanical Engineering, covers a variety of topics relating to solar energy.

Representative Course: Solar Heating (Mechanical Engineering)

Related Activities: Energy-related continuing education activities are also conducted.

CHATTANOOGA STATE TECHNICAL COMMUNITY COLLEGE

Energy Technology Program
Established January 1980

Contact:
Terry E. Townsend
Chattanooga State Technical Community College
4501 Amnicola Highway
Chattanooga, Tennessee 37406
(615) 622-6262

Type of Program: Formal interdepartmental program involving the Departments of Math, Science and Chemistry, as well as the Humanities

Degrees/Diplomas/Certificates: A.S.; Solar Installer's Certificate

Description/Objectives: This formal program in Energy Technology offers three areas of specialization: (1) Heating, Ventilating, and Air Conditioning Systems; (2) Energy Conservation; and (3) Solar Energy Technology. Students may elect any one of these three options. The primary objective of this program is to meet the rapidly expanding needs of the energy industry.

Representative Courses: Required courses are:
(1) Air Conditioning and Refrigeration Systems
(2) Solar Control Systems
(3) Principles of Heating Transfer
Other courses are:
(1) The Fundamentals of Solar Energy Technology
(2) Solar Energy System Design
(3) Introduction to Passive Design
(4) Alternate Energy Technology
(5) Energy Conservation
(6) Energy Design

Enrollment: 20

Faculty: 2 FT, 5 PT

Research: Solar energy and energy conservation

Research Funding: Industry

Related Activities: Mini-workshops are conducted on weekends for builders in both energy conservation and active/passive solar fundamentals. Energy-related courses are also offered through continuing education.

MEMPHIS STATE UNIVERSITY

Energy-Related Course

Contact:
Steve Scesa, Associate Professor
Department of Mechanical Engineering
Memphis State University
Memphis, Tennessee 38152
(901) 454-2173

Type of Program: Informal program consisting of an energy-related course offered by the Mechanical Engineering Department

Degrees/Diplomas/Certificates: Bachelor's and Master's levels

Description/Objectives: This course is offered to senior and graduate mechanical engineering students to prepare them for the practice of energy conservation and management. The course material includes the following: (1) outline of fundamental principles of thermodynamics, heat transfer, psychrometry, heating, ventilating, and air conditioning to specify the physical and operational data essential to energy conservation; (2) analysis of data to determine type and use of energy for specific functions such as domestic hot water, lighting, space cooling, equipment operation, process operation, etc.; (3) comparison of calculated energy use for specific functions on annual basis with utility data; (4) development of energy conservation opportunities to obtain energy and cost savings as well as payback period; (5) completion of project in which each student performs tasks on a particular building.

Representative Course: Energy Conservation and Management

MIDDLE TENNESSEE STATE UNIVERSITY

Energy-Related Courses and Workshops

Contact:
Earl Keese, Director of Continuing Education
Middle Tennessee State University
P.O. Box 44
Murfreesboro, Tennessee 37130
(615) 898-2462

Type of Program: Informal program consisting of energy-related courses and workshops offered through Continuing Education

Description/Objectives: The following are the energy-related courses and workshops offered: (1) A short course in solar building fundamentals is designed to acquaint local home builders with solar energy and energy conservation techniques; (2) A workshop is given in solar greenhouse construction. It is designed to acquaint participants with the uses and potential of a solar greenhouse, to provide the design and operation of a solar greenhouse, to discuss building skills, and to provide a laboratory experience in building a solar greenhouse; (3) A solar water heating installation workshop is also offered. It is designed to provide training for installers of solar water-heating systems. The target audience of this workshop is primarily plumbers and contractors. There is also a program in personnel training and energy advice designed to show participants how to organize and manage a residential energy audit program.

ROANE STATE COMMUNITY COLLEGE

Coal Mining Technology
Established 1977

Contact:
Pete Charton, Associate Dean
Roane State Community College
Harriman, Tennessee 37748
(615) 354-3000, x296

Type of Program: Formal program which is a specialization within the Engineering Technologies Department

Description/Objectives: The Coal Mining Technology Program is designed to train persons for technical and mid-management level positions in the coal mining Industry. It provides background in techniques, safety, and the environmental concerns of mining.

Representative Course: Energy and Society (Sociology/Coal Mining Technology)

Enrollment: 55

Faculty: 2 FT, 6 PT

Student Assistance: Regular assistance

Research: Research in coal preparation and plant efficiency is currently being conducted in conjunction with Oak Ridge National Laboratory.

Research Funding: Federal

Related Activities: Energy-related community activities and outreach programs are also conducted. The Tennessee Valley Authority has supported the "Surface Mining Continuing Education Project."

AMARILLO COLLEGE

1. Energy-Related Courses
2. Energy Information Center (Proposed)

Contact:
Clifford W. Siess, Director
Off-Campus Programs
Amarillo College
P.O. Box 447
Amarillo, Texas 79178
(806) 376-7904

Type of Program:
1. Informal interdepartmental program consisting of energy-related courses in the Natural Sciences and in Continuing Education
2. A center which provides material and information on energy

Description/Objectives:
1. This program consists of both college credit courses and courses for which Continuing Education Units are awarded. The Continuing Education courses are designed to provide specific technical training.
2. An Energy Information Center is planned which will encompass these energy-related courses and have a section set aside in the Learning Resources Center where publications and audiovisuals will be maintained. The proposed center will also be the coordinating office for all energy activities at the College.

Representative Courses:
(1) Residential and Commercial Energy Studies (Physical Science)
(2) Energy Resources (Physical Science)
(3) Home Energy Analysis Training (Continuing Education)
(4) Solar Systems, Design and Installation (Continuing Education)
(5) Solar Systems Seminar (Continuing Education)

Enrollment: 30

Faculty: 2 PT

Related Activities: Energy-related community activities are also conducted with presentations covering the areas of energy resources, wind energy, energy conservation, alternate energy sources, and solar hot water and space-heating systems.

NAVARRO COLLEGE

1. Solar Tech Program

Contact:
Arthur C. Meyers III, Director
Solar Project
Navarro College
Post Office Box 1170
Corsicana, Texas 75110
(214) 874-6501

Type of Program: Formal two-year degree program in solar technology

Degrees/Diplomas/Certificates: A.A.S. in Solar Technology

Description/Objectives: This program is designed for both high school graduates and those with previous mechanical or heating, ventilating, and air-conditioning competency. The solar tech curriculum includes laboratory activities and experiments in the appropriate courses. This modular program consists of both technical courses which provide training and hands-on experience in the skills and tasks the solar energy technician will be expected to perform.

Representative Courses:
(1) Energy Science
(2) Sizing Design and Retrofit
(3) Collectors and Energy Storage
(4) Operational Disagnosis

External Funding: National Science Foundation

Research Funding: National Science Foundation

NAVARRO COLLEGE—continued

2. Solar Mechanic/Installer Certificate of Completion Program

Contact:
Alan Boyd, Campus Coordinator
Solar Tech Project
Navarro College
Post Office Box 1170
Corsicana, Texas 75110
(214) 874-6501

Type of Program: Formal one-year certificate program in solar energy installation

Degrees/Diplomas/Certificates: Certificate of Completion in Solar Energy Installation

Description/Objectives: Students are trained in the installation, maintenance, and servicing of solar collector systems, solar-assisted heat pumps, solar back-up heating units, solar water heaters, heat-exchange units, and energy storage facilities. This program also prepares students for entering the two-year A.A.S. solar technician degree program as an advanced student.

Representative Courses:
(1) Air Conditioning Principles
(2) Introduction to Solar Heating and Cooling
(3) Materials and Fabrication

Student Enrollment: 30

Annual Budget: $20,000

External Funding: Texas Education Agency

NAVARRO COLLEGE—continued

3. Alcohol Fuel Workshops

Contact:
C. Paul Green, Dean of Institutional Development
Navarro College
Post Office Box 1170
Corsicana, Texas 75110
(214) 874-6501

Type of Program: Formal energy program consisting of alcohol fuel workshops

Description/Objectives: This program involves the building of an alcohol still and conducting of workshops to instruct local farmers in its potential as an alternate energy source. Workshops consist of an integrated three-day seminar as well as hands-on experience for each participant. Workshops are designed to cover necessary background information and technical content, as well as to provide actual hands-on experience in alcohol and alcohol fuels production using agricultural products.

External Funding: U.S. Department of Energy

TEXAS A & I UNIVERSITY

Natural Gas Engineering Program

Contact:
J. Browning Finley, Chairman
Chemical and Natural Gas Engineering
Texas A & I University
Kingsville, Texas 78363
(512) 595-2001

Type of Program: Formal interdisciplinary program leading to a degree in two energy-related areas

Degrees/Diplomas/Certificates: B.S.; M.S.; and Master of Engineering

Description/Objectives: This program, involving the Chemical Engineering and Natural Gas Department, offers two options for pursuing energy-related studies: the Natural Gas Engineering Program, which has an energy-related orientation, and energy-related studies offered by Chemical Engineering.

Representative Courses:
(1) Energy and Mass Transport (Natural Gas Engineering)
(2) Chemical Engineering Plant Design (Chemical Engineering)
(3) Primary Energy Conversion (Natural Gas Engineering)

Faculty: 8 FT, 2 PT

Student Assistance: Corporate scholarships; and departmental grants for research

Annual Budget: $240,000

External Funding: Corporate—$2,000

Research: Coal Gas Synthesis

Research Funding: Corporate donations

Related Activities: Energy-related adult education, extension courses, professional training courses and outreach programs are also conducted.

TRINITY UNIVERSITY

Solar Energy Studies Program
Established 1976

Contact:
Eugene Clark, Chairman
Solar Energy Curriculum Committee
Trinity University
715 Stadium Drive
San Antonio, Texas 78284
(512) 736-7504

Type of Program: Formal interdisciplinary graduate program leading to a degree with a solar energy specialization

Degrees/Diplomas/Certificates: M.S.

Description/Objectives: This interdisciplinary program involves new courses from the Departments of Engineering Science and Physics. The core curriculum emphasizes thermal utilization of solar energy for heating and cooling buildings. Students in this program may select one of four Master of Science degree tracks: (1) Computing Science, (2) Engineering Science, (3) Physics, and (4) an individualized interdisciplinary degree in Solar Energy Studies.

Representative Courses: Required courses are:
(1) Design of Passive Heating and Cooling (Engineering Science)
(2) Modeling and Computer Analysis (Engineering Science)
(3) Solar Energy Systems Design (Engineering Science)
(4) Solar Energy System Components (Engineering Science)
(5) Heat Transfer/Thermodynamics (Engineering Science)
(6) Photovoltaics (Physics)
(7) Solar and Atmospheric Radiation (Physics)

Enrollment: 20

Faculty: 7 FT

Student Assistance: Graduate Assistantships (tuition and stipend)

Research: Headquarters and primary observing site for the Solar-Meteorological Research and Training Program; National Feasibility Assessment of Passive Residential Cooling; and Passive Solar Dessicant Dehumidification.

Research Funding: U.S. Department of Energy—Solar-Meteorological Research and Training program and the National Feasibility Assessment of Passive Residential Cooling; Texas Energy and Natural Resources Advisory Council—Passive Solar Dessicant Dehumidification.

Related Activities: Energy-related adult education and community activities are also conducted.

UNIVERSITY OF HOUSTON AT CLEAR LAKE CITY

Energy Awareness Project
Established 1976

Contact:
John Steinbrink, Associate Professor
University of Houston at Clear Lake City
2700 Bay Area Boulevard
Houston, Texas 77058
(713) 488-9270

Type of Program: Formal summer session program for teachers, organized as an Institute

Description/Objectives: This three-week graduate workshop for teachers is non-technical and features prominent speakers on energy topics and curriculum design. The goals of the Institute are to provide as much factual and conceptual information as possible about energy sources and demands, energy conservation, energy and global interdependence, energy and the economic system, and the energy industry in Texas; and to provide an opportunity for the teacher-participant to design and develop an instructional unit in science, language arts, social studies, or the fine arts. Graduate credit may be obtained.

Representative Course: Energy: A Humanizing Experience (Education)

Enrollment: 75

Faculty: Summer: 2 FT, 5–6 PT

Student Assistance: Full tuition stipends for 70 teachers

External Funding: Shell Companies Foundation, Inc.

Research: Energy education curriculum

Research Funding: Private foundation

Related Activities: Energy-related programs for teachers (in addition to the Institute) and for churches are also conducted.

UNIVERSITY OF HOUSTON, CENTRAL CAMPUS

Heat Energy Power Applications Program
Established September 1975

Contact:
Bernard C. Kirklin, Director
University of Houston
6129 Brooklea
Houston, Texas 77087
(713) 649-1516

Type of Program: Formal interdisciplinary program administered by the Department of Mechanical Technology and involving courses from Electrical Technology and Business Technology

Degrees/Diplomas/Certificates: B.S.

Description/Objectives: The Heat Energy Power Applications program is designed to prepare students for careers in energy conversion machines, equipment, and processes as well as for careers in energy conservation. In addition, the program introduces students to careers in alternate energy sources such as solar energy.

Representative Courses: Required courses are:
(1) Introduction to Thermodynamics (Mechanical Technology)
(2) Psychometrics (Mechanical Technology)
(3) Applied Fluid Mechanics (Mechanical Technology)
(4) Heat Engines Applications (Mechanical Technology)
(5) Alternate Energy Studies (Mechanical Technology)

Enrollment: 45

Faculty: 2 FT; 4 PT

Student Assistance: Fellowship and internship programs

Annual Budget: $143,000

External Funding: U.S. Department of Energy

Research: An Energy Laboratory, funded by the state, was designed to develop energy research programs and to aid faculty in developing and obtaining grants for energy research.

Research Funding: State of Texas

Related Activities: An Energy Extension Service (which receives assistance from the State) is designed to aid the general public in conserving energy through audit, workshops, and seminars, distribution of energy conservation information, and increasing awareness.

UNIVERSITY OF HOUSTON, DOWNTOWN COLLEGE

Energy Information Service
Established May 1979

Contact:
Warren L. Baker, Director
University of Houston, Downtown College
One Main Street
Houston, Texas 77002
(713) 749-1961

Type of Program: Informal program consisting of a public information service

Description/Objectives: The Energy Information Service publishes *U.S. Energy Facts*, a monthly and annual statistical report. This service also has an energy library and responds to requests for specific energy information.

Annual Budget: $22,000

External Funding: Contributions, memberships, and subscriptions from individuals and corporations—$2,500

THE UNIVERSITY OF TEXAS AT AUSTIN

Energy-Related Degree Programs

Contact:
R.J. Million
Center for Energy Studies
Engineering Science Building-143
The University of Texas at Austin
Austin, Texas 78172
(512) 471-4946

Type of Program: Formal interdisciplinary energy-related programs

Degrees/Diplomas/Certificates: Bachelor's and Master's level

Description/Objectives: Energy-related degree programs are found in the following schools and disciplines: Business Administration; General and Comparative Studies; Social and Behavioral Sciences; Engineering; Natural Sciences; Architecture; Public Affairs (graduate only); Law; and Engineering and Public Affairs (joint, graduate only).

Representative Courses:
(1) Energy Conscious Design (Architecture)
(2) Introduction to the Study of Resources (Resources)
(3) Coal Research Seminar (Chemistry)
(4) Applied Solar Energy (Electrical Engineering)
(5) Nuclear Power Systems (Mechanical Engineering)
(6) Oil and Gas Seminar (Law)
(7) People, Petroleum, and Politics (Middle Eastern Studies)
(8) Physics of Energy Production and Use (Physics)
(9) Natural Resources Policy Issues (Public Affairs)
(10) Politics of Oil (Government)

Student Assistance: Regular assistance

Research: Solar Energy Laboratory

Related Activities: The College of Engineering has an extensive program in continuing education engineering studies. Topics include Energy Conservation and Management in Industrial Operations and Solar Energy Application in Residential/Commercial Buildings.

UNIVERSITY OF UTAH

Energy Law Center
Established July 1979

Contact:
Betty L. Hollis
Energy Law Center
College of Law
University of Utah
Salt Lake City, Utah 84112
(801) 581-5880

Type of Program: Formal program within the College of Law organized as an Institute

Degrees/Diplomas/Certificates: J.D.; LL.M. (projected)

Description/Objectives: This program is designed to train students in the legal questions surrounding the policy and technical needs of energy and resources. In addition to an established energy curriculum in the J.D. program, a separate post-J.D., research-oriented program leading to an LL.M. degree is planned.

Representative Courses:
(1) Energy Law
(2) Environmental Law
(3) Oil, Gas and Mining
(4) Regulated Industries
(5) Water Law

Enrollment: 20

Faculty: 3 FT, 4 PT

Student Assistance: A variety of scholarship and research awards available for J.D. candidates, as well as two post-graduate assistantships

Annual Budget: $25,000

External Funding: The Michael Foundation

Research: Legal aspects involving energy

Research Funding: University; and Federal grants

MIDDLEBURY COLLEGE

Middlebury Energy Council
Established 1977

Contact:
Russell J. Leng, Dean of Sciences and Chairman
Middlebury Energy Council
Middlebury College
Middlebury, Vermont 05753
(802) 388-7964

Type of Program: Informal program organized as a council and involving a cross-section of the campus population

Description/Objectives: An Energy Council was established to formulate a concise, easily understood energy policy for the college. The Council also advises the president and the business and financial offices on procedures and approaches to programs. Finally, it helps communicate the energy conservation programs and attempts to answer those persons who have special problems or questions. The Energy Council developed: (1) the *Energy Memo*, a publication that answers questions, provides information, and seeks ideas, assistance and cooperation, and (2) the *Energy Book*, located at the main desk of the library, where students or faculty can make complaints or leave messages for review by the Energy Council.

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UNIVERSITY OF VERMONT

Home Energy Audit Program
Established May 1980

Contact:
Tom Patterson, Coordinator
Extension Energy Program
University of Vermont
Agriculture and Engineering Building
Burlington, Vermont 05405
(802) 656-2001

Type of Program: Formal outreach program in collaboration with the Vermont State Energy Office

Description/Objectives: This program emphasizes the education of the homeowner in home energy use as well as in building improvements. Service is provided through both personal contact and written report.

Annual Budget: $272,900

External Funding: U.S. Department of Energy, Energy Extension Service

Research: Wind power

Related Activities: Adult education and extension courses such as the Solar Farm Demonstration Program, the Alcohol Fuels Demonstration Program and the Dairy Farm Energy Management Analysis Program are also conducted.

CARNEGIE-MELLON UNIVERSITY/MELLON INSTITUTE

Energy Productivity Center
Established 1977

Contact:
Leith Mann, Office Manager
Energy Productivity Center
Mellon Institute
1925 North Lynn Street
Suite 1200
Arlington, Virginia 22209
(703) 522-0073

Type of Program: Formal energy-related research program that is organized as a Center

Description/Objectives: The Energy Productivity Center was established by Mellon Institute (an autonomous division of Carnegie-Mellon University) to research the role of energy conservation in the United States energy policy, and was later broadened to include energy productivity. The center is involved in studies and activities that are designed to reduce the cost of energy services in transportation systems, homes, offices, and industrial processes. Reports, reflecting these areas of interest, published to date include: "Least-Cost Energy Strategy," "Creating New Choices," and "Maintaining Automotive Ability."

External Funding Sources: U.S. Department of Energy; and private industry

Research: See Description/Objectives (above)

MARY BALDWIN COLLEGE

Energy-Related Course

Contact:
George McCune, Director
Program of Continuing Education
Mary Baldwin College
Staunton, Virginia 24401
(703) 885-0819, x230

Type of Program: Informal program consisting of one energy-related course offered through Continuing Education

Description/Objectives: This course is offered in cooperation with the newspaper, the *Staunton Leader*, which publishes fifteen regularly scheduled lessons. In addition, there are five in-depth seminar discussion sessions on campus and additional supplementary materials.

Representative Course: Energy and the Way We Live (course by newspaper)

Student Assistance: Senior-citizen assistance

OLD DOMINION UNIVERSITY

Energy-Related Courses

Contact:
Old Dominion University
Hampton Boulevard
Norfolk, Virginia 23508
(904) 489-6000

Type of Program: Informal program consisting of energy-related courses within the Department of Mechanical Engineering and Industrial Programs Service

Description/Objectives: These courses cover a variety of energy-related topics including solar energy and energy conservation.

Representative Courses:
(1) Radiation Heat Transfer (Mechanical Engineering)
(2) Energy Utilization and Conservation (Mechanical Engineering)
(3) Advanced Topics in Solar Energy (Mechanical Engineering)
(4) Solar Power Engineering (Mechanical Engineering)
(5) Power and Energy Lab II (Mechanical Engineering Technology)
(6) Solar Energy Systems (Mechanical Engineering Technology)
(7) Energy Conversion (Mechanical Engineering Technology)
(8) Solar Energy: Principles and Application in Existing Structures (Industrial Programs Service)
(9) Passive Solar Home Design-New Construction (Industrial Programs Service)
(10) Solar Construction (Industrial Programs Service)

Research: Consulting research for area companies

Research Funding: Virginia Electric and Power Company

RANDOLPH-MACON COLLEGE

Energy-related Course
Established 1977

Contact:
William P. Hesse, Assistant Professor
Department of Physics
Randolph-Macon College
Ashland, Virginia 23005
(804) 798-8372

Type of Program: Informal program consisting of an energy-related course within the Department of Physics

Degrees/Diplomas/Certificates: B.A., B.S. levels

Description/Objectives: Each year a one-month course is offered through the Department of Physics and explores various energy-related topics.

Representative Courses:
(1) Alternative Energy Technologies
(2) Solarizing Your Home
(3) Energy Audit of the College
(4) Energy: How Did We Get Here? Where Do We Go From Here?

Enrollment: 20

Faculty: 1 PT

Research: Design of solar air collectors and monitoring of performance by microcomputer

Research Funding: Department of Physics, and local industry

UNIVERSITY OF VIRGINIA

Energy Policy Studies Center
Established October 1979

Contact:
Fred Rosi, Executive Director
Energy Policy Studies Center
University of Virginia
Thorton Hall
Charlottesville, Virginia 22903
(804) 924-3302

Type of Program: Formal interdisciplinary program consisting of courses and research and organized as a Center

Degrees/Diplomas/Certificates: Bachelor's and Master's Levels

Description/Objectives: The Center has incorporated an interdisciplinary approach to energy policy involving the School of Commerce, the Department of Environmental Sciences, the Law School, and the Economics Department. A variety of energy-related courses are available and various research studies in energy policy are conducted.

Representative Courses:
(1) Energy and Society
(2) Energy Policy (Seminar)

External Funding: Private sector

Research: Research is conducted in energy policy

CLARK COMMUNITY COLLEGE

Energy-Related Courses
Established 1979

Contact:
Norman P. Roberts, Energy Coordinator
Clark Community College
1800 McLoughlin Boulevard
Vancouver, Washington 98663
(206) 699-0276

Type of Program: Informal interdisciplinary program consisting of energy-related courses within the Social and Natural Sciences

Description/Objectives: These energy-related courses cover a variety of topics, including solar energy and energy-related problems.

Representative Courses:
(1) Energy Problems (Political Science)
(2) Solar Energy (Science)
(3) Energy Living (Social Science Division—two-course sequence)

Enrollment: 25

Faculty: 1 FT, 1 PT

Related Activities: Energy forums (both on and off campus) and radio participation call-in broadcasts have been conducted under grants from the Oregon Committee for the Humanities and the Washington Commission for the Humanities.

SPOKANE FALLS COMMUNITY COLLEGE

Energy-Related Course
Established 1979

Contact:
Ronald L. Needham, Division Supervisor
Math/Science
Spokane Falls Community College
W. 4310 Fort George Wright Drive
Spokane, Washington 99202
(509) 345-2897

Type of Program: Formal program consisting of one evening course

Degrees/Diplomas/Certificates: Certificate of Completion

Description/Objectives: This program, consisting of an evening extension course over three academic quarters, teaches students how to design an earth-sheltered, energy-efficient residential structure. Students explore design and energy management techniques, design three-dimensional models, and go through all the necessary steps (costs, engineering, code approvals, financing, contracting, and legal aspects) preparatory to building an energy-efficient home.

Representative Course: Earth-Sheltered Home Construction

Enrollment: 120 PT

Faculty: 5 PT

Annual Budget: $2,500

TACOMA COMMUNITY COLLEGE

Energy Management Technicians' Program
Established September 1979

Contact:
Ivonna McCabe, Chairman
Math-Science Division
Tacoma Community College
5900 South 12th
Tacoma, Washington 98465
(206) 756-5059

Type of Program: Formal interdisciplinary program involving the Departments of Physics, Engineering, and Chemistry

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This two-year program places a strong emphasis on physics and chemistry as well as technical courses in electricity and electronics. The primary objective of the program is to train technicians to work in the field of energy utilization and conservation in audits, design systems, and building engineering.

Representative Courses:
(1) Energy Production Systems (Energy)
(2) Electromechanical Devices (Electricity)
(3) Energy Conservation (Energy)
(4) Codes and Regulations (Energy)
(5) Energy Economics (Economics)

Enrollment: 39

Faculty: 2 FT, 10 PT

Annual Budget: $30,000 (approximate)

External Funding: Federal vocational—$20,000

Related Activities: Energy-related adult and consumer education, extension courses, and community activities are also conducted.

UNIVERSITY OF WASHINGTON

Energy Forum Northwest
Established 1978

Contact:
Robert D. Wilkinson, Project Manager
Energy Forum Northwest
Community and Organization Development
University of Washington
316 Lewis Hall, DW-25
Seattle, Washington 98195
(206) 543-0980

Type of Program: Formal non-traditional program consisting of a variety of community-oriented educational activities

Description/Objectives: Energy Forum Northwest was designed to encourage active individual and community participation in the search for new ways to meet the energy needs of the Pacific Northwest. It consists of a variety of non-traditional educational formats, including: (1)conducting workshops and conferences on energy throughout the region; (2) producing a documentary educational television film based on the workshops, which was viewed by over 200,000 people; (3) holding neighborhood energy workshops for communities, which in turn developed community-wide energy education and/or conservation programs.

Enrollment: 600 (workshops), 300 (conference), 200,000 viewers of TV film

Faculty: 3 PT

Annual Budget: $75,000

BLUEFIELD STATE COLLEGE

Mining Engineering Technology Program
Established 1968

Contact:
D.C. Klingensmith, Chairman
Division of Engineering Technology
Bluefield State College
Bluefield, West Virginia 27401
(304) 325-7102

Type of Program: Formal program that is a specialization within the Engineering Technology Division

Degrees/Diplomas/Certificates: A.S.; B.S. levels

Description/Objectives: This program is designed to prepare students in the area of coal mining.

Enrollment: 138

Faculty: 2 FT; 5 PT

Annual Budget: $44,000

External Funding: West Virginia Board of Regents—$44,000

Related Activities: Energy-related professional training courses are also conducted.

PARKERSBURG COMMUNITY COLLEGE

Energy Management Technicians' Program

Established Fall 1981 (Pending)

Contact:
Allan F. Gates, Dean of Instruction
Parkersburg Community College
Route 5, Box 167A
Parkersburg, West Virginia 26101
(304) 424-8242

Type of Program: Formal program that is a specialization within the Department of Engineering Technology

Degrees/Diplomas/Certificates: A.A.; A.A.S.; Certificate

Description/Objectives: This program is designed to give students expertise in energy conservation by public agencies, businesses, or industries. A certificate is available for those who complete approximately one-half of the total program.

Student Assistance: Institutional scholarship funds

Related Activities: Public forums were part of the "Energy and the Way We Live" program sponsored in cooperation with other colleges in the State. A nine-county area was covered by the Parkersburg Community College forums.

WEST VIRGINIA UNIVERSITY

1. Energy Research Center
Established 1978

Contact:
M. Dayne Aldridge, Director
Energy Research Center
West Virginia University
Morgantown, West Virginia 26506
(304) 293-2867

Type of Program: Formal program consisting of an autonomous research center, separate from traditional academic units but reporting to the vice president for energy studies

Description/Objectives: The educational goal of this program is to produce advanced degree graduates in a wide range of disciplines with research experience in coal in particular, as well as in other energy areas important to the state and the nation. The needs of the coal industry will be partially met by this program as well. Students preparing for careers in engineering, science, economics, law, and other fields participate in various research projects, along with faculty.

Enrollment: 250 PT

Faculty: 250 FT

Annual Budget: $4,000,000

External Funding: Federal, state, and private sources

Research: $12,000,000 for 176 energy research projects involving 230 graduate students in 42 different departments and units

Research Funding: Federal, state, and private sources

WEST VIRGINIA UNIVERSITY – continued

2. Energy Education: Concepts and Dilemmas Workshop
Established 1978

Contact:
David L. McCrory, Associate Professor and Coordinator of Field Services
West Virginia University
Morgantown, West Virginia 26506
(304) 293-3030

Type of Program: Formal interdisciplinary program consisting of a summer teacher education workshop

Description/Objectives: The goals of this program are: (1) to raise the level of knowledge of secondary school teachers in the area of energy; (2) to develop and test interdisciplinary and ten multidisciplinary units of instruction on energy topics; (3) to test a particular vehicle of teacher education in the area of energy. The program is held during the summer, and covers such topics as solar and wind energy, environmental impacts, energy economics, energy conservation, and instructional resources.

Annual Budget: $19,000

External Funding: U.S. Department of Energy

WEST VIRGINIA UNIVERSITY—continued

3. Home Energy Conservation Workshop Project
4. Home Energy Conservation Training Project
Established
3. *1978*
4. *1979*

Contact:
David L. McCrory, Associate Professor and Coordinator of Field Services
West Virginia University
Morgantown, West Virginia 26506
(304) 293-3030

Type of Program: Formal programs consisting of training workshops organized under the university's field services

Description/Objectives:
3. The aim of this program is to train low-income people in methods of energy conservation in the home. Workshops are given by university faculty and are held in senior citizens' centers, churches, and other community centers.
4. The aim of this program is to induce a multiplier effect based on the above program. Here community service agency workers are trained in methods of teaching energy conservation so that they may in turn teach thousands of homeowners in their communities.

Enrollment:
3. 2,000

External Funding: Higher Education Act, Title I

MARQUETTE UNIVERSITY

Energy-Related Seminar
Established August 1980

Contact:
Michael Farmer, Assistant Director
Division of Continuing Education
Marquette University
1217 West Wisconsin Avenue
Milwaukee, Wisconsin 53233
(414) 224-6360

Type of Program: Informal program consisting of an energy-related seminar offered through continuing education

Description/Objectives: This seminar was designed to help building owners and managers reduce their energy costs using a variety of energy conservation techniques. Continuing education credits are available for those who participate in the seminar.

Representative Course: Energy Conservation Opportunities in Existing Buildings

Enrollment: 50

Annual Budget: $5,085

RIPON COLLEGE

Energy-Related Course

Contact:
Wayne Broshar, Professor of Physics
Ripon College
Ripon, Wisconsin 54971
(414) 748-8118

Type of Program: Informal program consisting of one energy-related course offered through the Department of Physics

Description/Objectives: This program is designed to increase student awareness of potential energy sources, limited resources, the use and abuse of energy, and measurement techniques.

Representative Course: Energy-Physics (Physics Department)

Enrollment: 50

Related Activities: Energy-related adult education, outreach programs, and senior-citizen and community activities are also conducted.

UNIVERSITY OF WISCONSIN–GREEN BAY

Energy Science and Technology Program
Established September 1980

Contact:
Thomas McIntosh, Professor
University of Wisconsin—Green Bay
Green Bay, Wisconsin 54302
(414) 465-2369

Type of Program: Formal interdisciplinary program that is a specialization within the Department of Science and Environmental Change

Degrees/Diplomas/Certificates: B.S.

Description/Objectives: The problem of the "energy crisis" is examined through courses in alternate energy systems, energy conservation, conventional energy systems and energy education. The goal of this program is to provide an understanding of the scientific principles which underly energy production and utilization. Many opportunities are available for independent study and practical experience in solar energy systems. Special emphasis is given to economic and management aspects of energy problems.

Representative Courses: Required courses are:
(1) Conventional Energy Technology
(2) Solar and Alternate Energy Technology
(3) Geology of Energy Resources
Other courses are:
(1) Energy for Society
(2) Resource Management Technology
(3) Environmental Law

Enrollment: 6

Faculty: 5 PT

Student Assistance: University scholarship programs

External Funding: Department of Energy, and National Science Foundation

UNIVERSITY OF WISCONSIN – PARKSIDE

Energy-Related Courses
Established 1973

Contact:
Morris W. Firebaugh, Professor
University of Wisconsin—Parkside
Greenquist Hall
Kenosha, Wisconsin 53141
(414) 553-2465

Type of Program: Informal program consisting of energy-related courses

Description/Objectives: These energy-related courses investigate solar energy and other energy alternatives and examine the technical and social aspects of various energy alternatives.

Representative Courses:
(1) Energy Alternatives (Physics)
(2) Introduction to Solar Energy (Engineering)

Enrollment: 40

Faculty: 2 PT

Related Activities: Community activities and outreach programs, such as lectures on nuclear energy, are also conducted.

UNIVERSITY OF WISCONSIN–STEVENS POINT

Energy Resource Analysis Program

Established 1980–81

Contact:
Peter Wetterlind, Assistant Professor
University of Wisconsin—Stevens Point
Science Building
Stevens Point, Wisconsin 54481
(715) 346-4607

Type of Program: Formal interdisciplinary program involving the Departments of Philosophy, Natural Resources, and Computer Science

Degrees/Diplomas/Certificates: B.S.

Description/Objectives: This program's concentrations are available in Computer Science, Natural Resource Management, and Business and cover a variety of energy-related topics.

Representative Courses:
(1) Survey Course on Energy (Chemistry and Physics)
(2) Environmental Impact Statement Development (Natural Resources)
(3) Energy Simulations (Computer Science)
(4) Energy Issue Investigation (Natural Resources)
(5) Energy Ethics (Philosophy)

Research: Energy site development impact analysis

Related Activities: The University of Wisconsin—Stevens Point Central Wisconsin Environmental Station has a number of demonstration facilities. The station offers teacher training programs, sponsored by the National Science Foundation, as well as programs for school groups and the community.

WESTERN WISCONSIN TECHNICAL INSTITUTE

Facilities Energy Management Technicians' Program

Established Fall 1981 (Projected)

Contact:
William G. Welch, Sr.
Western Wisconsin Technical Institute
6th and Vine Streets
La Crosse, Wisconsin 54601
(608) 785-9178

Type of Program: Formal interdisciplinary program offered through the Industrial Division, and involving the disciplines of Air Conditioning and Electric Power

Degrees/Diplomas/Certificates: A.A.

Description/Objectives: This program is specifically directed at energy conservation and is designed to train technicians in managing the energy producing and consuming mechanical and electrical systems of building plants and complexes. The program is scheduled at times convenient for those already employed who lack training in energy management.

Representative Courses: Required courses offered by the Department of Air Conditioning are:
(1) Principles of Energy
(2) Load Calculations
(3) Steam and Fluid Systems

Enrollment: 65+

Faculty: 5 FT, 6 PT

Student Assistance: Co-op work training

Related Activities: Energy-related adult and consumer education and extension courses are also conducted.

WISCONSIN INDIANHEAD VOCATIONAL, TECHNICAL AND ADULT EDUCATION DISTRICT

Facility Energy Engineering Technician Program

Established Fall 1979

Contact:
Daniel J. Wagner, Facility Energy Engineering Technician
Wisconsin Indianhead Vocational, Technical and Adult Education District
P.O. Box B
Shell Lake, Wisconsin 54871
(715) 468-2815

Type of Program: Formal degree program

Degrees/Diplomas/Certificates: A.A.S.

Description/Objectives: This two year program is designed to train students to manage the energy-producing and consuming mechanical and electrical systems of building plants, and complexes to serve commercial, institutional, and industrial sectors. The program presents the theoretical knowledge necessary to understand the functions of mechanical systems, managerial skills requisite to organizing operational services, interpersonal relationships as an aspect of supervision and employee interaction, and the practical mechanical skills necessary to maintain proper systems operation. A unique aspect of this program is the Alternate Energy Lab at Superior Campus, engineered to accommodate a variety of energy-producing and converting devices and hardware that facilitates the frequent updating of instructional equipment as future technological changes dictate. This Lab is primarily a demonstration and teaching tool in utilization and maintenance of alternate energy sources and conservation, but provides a secondary benefit of educating the public on new energy technology.

Enrollment: 18

External Funding: Alternate Energy Lab: Upper Great Lakes Regional Commission and the Vocational Education Amendments

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